

# THE PSYCHOLOGICAL BULLETIN

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PROCEEDINGS OF THE FORTY-SIXTH ANNUAL  
MEETING OF THE AMERICAN PSYCHOLOGICAL  
ASSOCIATION, INCORPORATED, COLUMBUS,  
OHIO, SEPTEMBER 7, 8, 9, 10, 1938

REPORT OF THE SECRETARY, WILLARD C. OLSON,  
UNIVERSITY OF MICHIGAN

The American Psychological Association, Inc., held its Forty-sixth Annual Meeting at the Ohio State University, Columbus, Ohio, on Wednesday, Thursday, Friday, and Saturday, September 7, 8, 9, 10, 1938. A total of 1,153 persons registered, 239 being Members, 495 being Associate Members, 66 being newly elected Associates, and 316 being persons not affiliated with the Association. An analysis of the registration by geographical districts and states is as follows: New England States, 88 (Connecticut 37, Massachusetts 33, Rhode Island 6, New Hampshire 6, Maine 4, Vermont 2); Middle Atlantic States, 252 (New York 160, Pennsylvania 72, New Jersey 18, Delaware 2); South Atlantic States, 66 (District of Columbia 10, Maryland 15, Georgia 3, North Carolina 19, Florida 5, West Virginia 7, Virginia 7, South Carolina 0); East North Central States, 521 (Illinois 114, Indiana 36, Michigan 54, Ohio 301, Wisconsin 16); East South Central States, 36 (Kentucky 17, Tennessee 9, Mississippi 2, Louisiana 5, Alabama 3); West North Central States, 133 (Iowa 51, Kansas 15, Minnesota 40, Missouri 13, South Dakota 0, Nebraska 14, North Dakota 0); West South Central States, 10 (Arkansas 1, New Mexico 2, Texas 7, Okla-

homa 0); Mountain States, 13 (Colorado 10, Wyoming 2, Arizona 0, Montana 0, Utah 1, Nevada 0); Pacific States, 28 (California 25, Oregon 3, Washington 0, Idaho 0); Canada, 3; No data, 3.

The program of the American Psychological Association consisted of twenty-one scientific sessions in which 172 of the 178 scheduled papers were presented by Members and Associates. Six round tables were arranged for Thursday and Friday and fourteen research and instructional films were scheduled for Wednesday evening.

The Presidential Address was delivered by John Frederick Dashiell of the University of North Carolina at the general session in the Chapel of University Hall on Friday on the subject "Some Rapprochements in Contemporary Psychology." Members of the Department of Psychology entertained members and guests at the Faculty Club at the conclusion of the general session.

An exhibit of books and apparatus was held throughout the meeting.

The Psychometric Society arranged a scientific session on "Psychometrics" and a Round Table on "Factor Analysis" on Thursday in collaboration with the Program Committee of the American Psychological Association. Two hundred and one persons registered for the meetings. The Business Meeting of the Society was held on Wednesday. Officers continued for the coming year are: President: Joy Paul Guilford; Secretary: Jack W. Dunlap; and Treasurer: Albert K. Kurtz.

The National Institute of Psychology held sessions at 4:00 on Wednesday and Thursday. The Business Meeting was held at 5:00 p.m. on Wednesday. The officers for 1936-1941 are: President: Samuel W. Fernberger; Vice-President: F. L. Wells; Secretary-Treasurer: Karl M. Dallenbach; Directors: Franklin Fearing and Herbert Woodrow.

The Society for the Psychological Study of Social Issues arranged a scientific session on the "Psychology of Social Institutions" for Thursday in collaboration with the Program Committee of the American Psychological Association. Two hundred and fifteen persons registered for the meetings. At the Annual Business Meeting on Tuesday George W. Hartmann of Columbia University was elected Chairman for 1938-39 with G. W. Allport, F. H. Allport, Gardner Murphy, and E. C. Tolman as new members of the Council for the term 1938-40. I. Krechevsky of the University of Colorado was continued as Secretary-Treasurer. The same evening Gardner

Murphy delivered the presidential address on the subject "The Research Task of Social Psychology."

The American Association for Applied Psychology met September 5, 6, 7, and 8, 1938, in conjunction with the Association. Five hundred and thirty persons registered for the meetings. Besides the four research programs (listing 32 papers) arranged in collaboration with the Program Committee of the American Psychological Association, there were seven symposia and a round table, a public meeting with five addresses, a recessed organization meeting and the regular business meeting, and a large and varied array of conferences dealing with professional problems. Following the annual dinner the retiring President, Douglas Fryer, delivered an address on the subject "Applied and Professional Attitudes." Professor Donald G. Paterson was elected President, Dr. Horace B. English, Executive Secretary, and Dr. Jack W. Dunlap, Treasurer.

#### TRANSACTIONS OF THE ANNUAL BUSINESS MEETING

Due notice having been given, the Annual Business Meeting of the American Psychological Association, Inc., a quorum being present, was held on September 8, 1938, in the Chapel of University Hall, Ohio State University, Columbus, Ohio, at 8:15 P.M., with President Dashiell in the chair.

Upon motion duly made and seconded it was voted that the minutes of the Forty-fifth Annual Meeting at the University of Minnesota be approved as printed in the November, 1937, issue of the *PSYCHOLOGICAL BULLETIN*.

The Secretary distributed mimeographed materials covering Announcements and Recommendations of Council to serve as an agenda for the meeting.

On the recommendation of the Council of Directors it was voted to elect Godfrey Hilton Thomson as a member of the Association.

On the recommendation of the Council of Directors it was voted to transfer the eighteen Associates named below to the status of Member:

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|----------------------------|----------------------------|
| 1. Fred Brown              | 10. Albert K. Kurtz        |
| 2. Robert Hall Bruce       | 11. Paul Felix Lazarsfeld  |
| 3. Stephen Maxwell Corey   | 12. Rensis Likert          |
| 4. John Porter Foley, Jr.  | 13. Henry A. Murray        |
| 5. Ralph Wesley Gilbert    | 14. Leon Alfred Pennington |
| 6. Edward Girden           | 15. Malcolm G. Preston     |
| 7. Harold Oliver Gulliksen | 16. David Shakow           |
| 8. Carl Iver Hovland       | 17. James Bart Stroud      |
| 9. Francis W. Irwin        | 18. William Donald Turner  |

On the recommendation of the Council of Directors it was voted to elect as Associates the 250 persons whose names appear below:

1. Clifford R. Adams
2. Carl L. Anderson
3. John Peytor Anderson
4. Angelo Antonucci
5. Marion M. Astley
6. Marian Ruth Ballin
7. Virginia May Barber
8. W. Leslie Barnette
9. Dorothy Moss Barrett
10. Neil Riley Bartlett
11. Dorothy Walter Baruch
12. Brent Nelson Baxter
13. Kenneth Lamont Bean
14. Lloyd Henry Beck
15. Ralph Clairon Bedell
16. Kovoov T. Behanan
17. Arthur Berman
18. Sybille Berwanger
19. Albert LeRoy Billig
20. William John Boldt
21. Elden A. Bond
22. Eva Bond
23. Edward Bordin
24. Russell W. Bornemeier
25. Elsworth Vachel Bowers
26. Stella Martin Bowers
27. Rufus David Bowman
28. Herman Francis Brandt
29. E. Pearl Bretnall
30. Arthur Kelly Brintnall
31. Judson Seise Brown
32. Elias Fijer Bumatay
33. Paul S. Burnham
34. Judson Rea Butler
35. Leo Francis Cain
36. Helen Melissa Campbell
37. Alexander A. Capurso
38. Edward J. Carr
39. John Bissell Carroll
40. David Joseph Chesler
41. Kenneth Edwin Clark
42. Weston R. Clark
43. Charles N. Cofer
44. Hubert Stanley Coffey
45. Louis David Cohen
46. Anna Louise Collins
47. Myrtle Elizabeth Corliss
48. Albert Charles Cornsweet
49. Mary Roberts Crowley
50. Helen Frances Cummings
51. James Wylie Curtis
52. Margaret T. Davidson
53. Frederick Barton Davis
54. Mildred Lee Davis
55. Herman de Fremery
56. Mildred Kathryn Dietsch
57. Daniel Guequierre Dittmer
58. John Henry Donnelly
59. Sister Mary Verda Dorsch
60. Randolph Scarborough Driver
61. Sister Mary D. Dunkerly
62. Allen L. Edwards
63. Royal Burdick Embree
64. Stanford Clark Ericksen
65. Anna Scholl Espenschade
66. Solomon David Evans
67. T. J. Farr
68. Mabel Rebecca Farson
69. Dorothy L. Fernow
70. Osta B. Feurt
71. Frank Whitney Finger
72. Oliver D. Fowler
73. Charles Blair Frasher
74. Joseph W. Friedlander
75. Robert Mills Gagne
76. William Egleston Galt
77. Herbert Noble Gardner
78. John William Gardner
79. Milton George Geil
80. Clayton d'Armond Gerken
81. Joseph William Goodrich
82. Rosalind Gould
83. Carolyn K. Grossman
84. Kathryn Elizabeth Grover
85. John Millard Hadley
86. Norma Ethel Hallett
87. Winslow Nichols Hallett
88. Andrew Williams Halpin
89. Jane Hamilton
90. Thomas Willard Harrell
91. Mildred Ruth Henrich
92. Franklin Melville Henry
93. Lois Mary B. Hilgeman
94. Chester James Hill, Jr.
95. Arthur Christian Hoffman
96. Virginia Hogan
97. Hilda Mary Holmes
98. H. Max Houtchens
99. Margaret Russell Hubbard
100. Bradford Benedict Hudson
101. Dorothy May Huebner
102. Selma Ingber
103. John Allan Irving
104. Florence Jennings
105. Lillian M. Johnson
106. Margaret Kaster Johnson
107. F. Nowell Jones
108. Louise Fenger Jones
109. Norman Kaplan
110. Oscar Kaplan
111. James S. Karslake
112. Ida B. Kelley
113. Bertha Kelso
114. Judith Peyton Key
115. Loena M. King
116. Virginia Kinsman



117. Albanus B. Kitzmiller
118. George Willard Knox
119. Sidney W. Koran
120. Jacob Sabation Kounin
121. Louis Krasno
122. Barbara L. Kruger
123. Elizabeth Louise Kuntz
124. Betty Lark-Horovitz
125. Robert Peter Larsen
126. Edward Lee Laushell
127. Roger Thomas Lennon
128. Eugene Lerner
129. Hollis M. Levenson
130. Bernice Jean Levin
131. Max Levin
132. Sidney Lewine
133. Virginia Whitney Lewis
134. Christine Lind
135. Bing-chung Ling
136. Elmer Gilbert Lipsitz
137. Catharine H. Loehrig
138. Jane Loevinger
139. Jacqueline S. London
140. Mary de Sales Louth
141. Constance Dora Lovell
142. Frances Lowrie
143. Max W. Lund
144. Jean Walker Macfarlane
145. John Walker Macmillan
146. I. Leon Maizlish
147. Robert Beverley Malmo
148. Betty M. Martinson
149. Albert P. Maslow
150. Harry M. Mason
151. John Wesley McDaniel
152. Louis L. McQuitty
153. Isadore Joseph Melsher
154. Mildred Mendenhall
155. Ruth Atherton Merrill
156. Lawrence William Miller
157. Bela Mittelman
158. Dannie Joseph Moffie
159. Maurice Charles Moggie
160. Mary Adelaide Morton
161. Mary Claire Myers
162. Maurice Newburger
163. Helen May Newcomb
164. Jean Elizabeth Newland
165. Mary R. Norris
166. C. Esco Obermann
167. John Algoth Ohlson
168. Lawrence O'Kelly
169. Carl Riley Oldroyd
170. William D. Orbison
171. Margaret Pankaskie
172. Willard E. Parker
173. Rosa Fales Parsons
174. William Perry
175. Sister M. Fridiana Peters
176. Iris Margaret Peterson
177. Luella May Raab
178. Donald Angus Ramsdell
179. John H. Rappaport
180. Harriet P. Ray
181. Janet E. Redfield
182. Harriet Lange Rheingold
183. Harry N. Rivlin
184. Elsa E. Robinson
185. Wesley S. Roeder
186. Hyman Rogosin
187. Mary Catherine Roland
188. William F. Roth
189. Grace Rubin-Rabson
190. Joseph Gerhard Saetveit
191. Edward McChesney Sait, Jr.
192. Virginia Somes Sanderson
193. Bert Reese Sappenfield
194. Theodore Roy Sarbin
195. Hartwell E. Scarbrough
196. Douglas E. Scates
197. Vernon G. Schaefer
198. Willis Carlton Schaefer
199. Frances Lear Schenck
200. Vincent Joseph Sharkey
201. Leroy Harold Sharp
202. Benjamin J. Shevach
203. Jane Burges Sill
204. Ray H. Simpson
205. Audrey Sims
206. Martin Singer
207. Alonzo de Grate Smith
208. Henry Clay Smith
209. Wiley Francis Smith
210. Jess Spier
211. Henrietta W. Steinberg
212. Matilda Steiner
213. Humbert G. Stout
214. Donald Edwin Super
215. William Herbert Swift
216. Edward Vernon Tenney
217. Albert Stoler Thompson
218. Claude Edward Thompson
219. Robert Carlton Topper
220. MacEldin Trawick
221. Carl Frederick Trieb
222. Mary Adah Trussell
223. Lyle Tussing
224. Curtis E. Tutthill
225. Robert B. Van Vorst
226. Walter A. Varvel
227. Harold Anthony Voss
228. Richard William Wallen
229. Florence H. Warshawsky
230. Frederick A. Waterman
231. Walter Samuel Watson
232. Livingston Welch
233. S. Medford Wesley
234. Robert G. Wetmore
235. Albert Edward Wiggam
236. Roy DeVerl Willey
237. Alexander Coxe Williams
238. David Carlton Williams
239. Stanley Burdick Williams
240. Edgar W. Wilson

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|------------------------|---------------------------|
| 241. Mary T. Wilson    | 246. M. Erik Wright       |
| 242. Verne E. Wilson   | 247. Harry Benjamin Wyman |
| 243. Edith Wladkowsky  | 248. Charles D. Yates     |
| 244. Barbara H. Wright | 249. Jesse Zizmor         |
| 245. Clare Wright      | 250. Philip John Zlatchin |

The Secretary announced the death of the following six Members: Kate Brousseau, July 7, 1938; John Edgar Coover, February 19, 1938; P. Harry Ewert, September 14, 1937; Melvin E. Haggerty, October 6, 1937; Grace O. McGeoch, September 5, 1937; and Bruce R. Payne, April 21, 1937; and the following three Associates: James O. Castiello, December 28, 1937; Gilbert Whitney Campbell, July 7, 1938; and Henry H. Donaldson, January 23, 1938.

The Secretary announced the resignation of the following five Members: Burtis B. Breese, H. A. Peterson, Ethel Chamberlain Porter, Erwin W. Runkle, and Joseph G. Yoshioka.

The Secretary announced the resignation of the following thirty-eight Associates: F. C. Bartlett, Michael S. Blankfort, Paul C. Bosse, Frederick W. Brown, James A. Carrell, L. M. Crabbs, Harvey L. Decker, Charles A. Drake, Abraham Falk, Ruth Burke Guilford, Ella Bolton O. Heim, W. E. Hinrichs, Donald D. Kinsey, Jerome T. Light, Forrest E. Linder, Oscar F. Litterer, Amy Muss, Genevieve H. Nelson, Morgan D. Parmenter, Robert H. Peckham, Mary L. Phares, Anna Polkowski, Lucena Quantius Price, Esther Theresa Radachy, Madella J. Rigby, Jacob L. Risk, Joseph Rossman, Ina Craig Santorius, Alice Leahy Shea, Myra E. Shimberg, Randolph B. Smith, Mabel Eaton Stewart, William J. Tait, Helen R. Thompson, Noel B. Van Wagenen, Nathaniel Warner, George E. Weigand, and Carleton L. Wiggin.

The Secretary announced that the following three Members have applied for and have received the status of Honorary Member: Francis Burke Brandt, Franklin O. Smith, and George M. Stratton.

The Secretary announced that the Council of Directors unanimously approved the actions of the President in making the following appointments:

Dr. Paul L. Whitely of Franklin and Marshall College to act as a representative of the American Psychological Association at the Sesqui-Centennial Celebration of Franklin and Marshall College on October 14 to 17, 1937.

Dr. Melvin G. Rigg of the Oklahoma A. and M. College to act as a representative of the American Psychological Association at the inauguration of Gordon Keith Chalmers as President of Kenyon College on October 23, 1937.

Dr. Samuel W. Fernberger of the University of Pennsylvania to act as a representative of the American Psychological Association at the joint meeting of the American Philosophical Society with Organizations and Institutions concerned with the Publication of Research on February 18 and 19, 1938.

Dr. I. Krechevsky of Swarthmore College to act as a representative of the American Psychological Association at the Forty-second meeting of the American Academy of Political and Social Science on April 1 and 2, 1938.

Dr. C. Homer Bean of the Louisiana State University to act as a representative of the American Psychological Association at a Group of Conferences on Higher Education and the Dedication of New Buildings of the Louisiana State University on April 6, 7, and 8, 1938.

Dr. Arthur M. Jordan of the University of North Carolina to act as a representative of the American Psychological Association at the One Hundredth Anniversary Celebration of Greensboro College on May 20 and 21, 1938.

Dr. Arden Frandsen of the Utah State Agricultural College to act as a representative of the American Psychological Association at the Semi-Centennial Celebration of the Founding of Utah State Agricultural College on June 5, 6, and 7, 1938.

Dr. E. C. Tolman, Chairman, presented the following report of the Committee on the Election of Officers:

President for 1938-39: Gordon W. Allport, Harvard University.

Directors for 1938-1941: Frank N. Freeman, University of Chicago; and Henry E. Garrett, Columbia University.

Nominees for appointment to the Division of Anthropology and Psychology of the National Research Council: Harold E. Burt, Ohio State University; Florence L. Goodenough, University of Minnesota; and Walter R. Miles, Yale University.

Representative on the Social Science Research Council: Richard M. Elliott, University of Minnesota.

The Forty-eighth Annual Meeting will be held at Pennsylvania State College on Wednesday, Thursday, Friday, and Saturday, September 4, 5, 6, and 7, 1940. The Council announced the desirability of the submission of invitations for the year 1941 and thereafter.

The Secretary announced that the Council of Directors has appointed Elmer K. Culler of the University of Rochester, Edward B. Greene of the University of Michigan, and the Secretary as the Program Committee for 1939 with Elmer K. Culler as Chairman.

The Secretary announced that the second joint meeting of the Council of Directors and Board of Editors was held on Tuesday, September 6, at which time reports on editorial and business policies were discussed.

The Council of Directors announced the completion of the dissolution of the Psychological Review Company under date of August 13, 1938.

The Council voted to instruct the incoming President, Gordon W. Allport, to present to Council for their approval at the earliest possible date members of a Committee on Assistance in Employment of Refugee Psychologists to report at the next meeting of Council.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Program Committee and ordered the report printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Program Committee on the coördination of the program of the American Psychological Association with that of other societies, ordered the report printed in the Proceedings and called to the attention of the secretaries of affiliated societies. See Reports.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee on Precautions in Animal Experimentation and ordered the report printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association voted to appoint Karl F. Muenzinger of the University of Colorado as a member of the Committee on Precautions in Animal Experimentation for the term 1938-1941.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee on Motion Pictures and Sound Recording Devices in Instruction of Psychology and ordered the report printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee to Study Problems Connected with the Teaching of Psychology in High Schools and Junior Colleges, ordered the report printed in the Proceedings, and discharged the Committee. The Association further voted that 1,000 copies of this report be printed and distributed to

presidents and teachers of psychology in teachers colleges. See Reports.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the Committee on Securing Financial Support for the Continuation of the *Psychological Abstracts*, ordered the report printed in the Proceedings, and discharged the Committee. See Reports.

On the recommendation of the Council of Directors the Association voted to reappoint Henry E. Garrett and Walter R. Miles as representatives on the Joint Committee with the Psychologists' League and to edit the title of the committee in conformity with actions by other associations.

On the recommendation of the Council of Directors the Association voted to acknowledge with thanks the informal report of progress of the Committee on the Preparation of Examination Questions in Psychology and to continue the Committee with its present membership.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of its representatives to the American Association for the Advancement of Science and ordered the report printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association voted to appoint Walter R. Miles of Yale University and John A. McGeoch of Wesleyan University as representatives of the American Psychological Association on the Council of the American Association for the Advancement of Science for 1939.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the representative to the American Documentation Institute, ordered the report printed in the Proceedings, and voted that John E. Anderson be continued as representative. See Reports.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of the delegates to the Inter-Society Color Council, ordered the report printed in the Proceedings, and voted continuance of affiliation with the Inter-Society Color Council for 1938-1939. See Reports.

On the recommendation of the Council of Directors the Association voted to reappoint its voting delegates and additional delegates to the Inter-Society Color Council for the term 1938-1939 and to continue the present vacancy on the delegation.

On the recommendation of the Council of Directors the Associ-



ation voted to accept the invitation of the Inter-Society Color Council to act as sponsor, without financial obligation, of the 1939 meeting of the Inter-Society Color Council.

On the recommendation of the Council of Directors the Association voted to accept with thanks the informal report of the representative to the National Occupational Conference.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of its representative to the National Research Council and ordered the report printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association voted to appoint John G. Jenkins of the University of Maryland as the representative of the Association to the New York Management Council.

On the recommendation of the Council of Directors the Association voted to accept with thanks the report of its representatives to the Social Science Research Council and ordered the report printed in the Proceedings. See Reports.

The Secretary announced that the Council of Directors had studied a detailed report on the advantages and financial possibility of supplying copies of the *Psychological Bulletin* to all Associates and Members of the Association. On the recommendation of the Council of Directors the Association voted to send copies of each issue of the *Psychological Bulletin*, beginning January 1, 1939, to all Members and Associates; to allocate 75 cents of each Member's and Associate's present dues to the *Psychological Bulletin* beginning January 1, 1939; to issue the Program of the Annual Meeting regularly as the July number of the *Psychological Bulletin*; to publish the Presidential Address regularly in the January issue of the *Psychological Bulletin*; to publish the Proceedings, as in the past, in the November issue of the *Psychological Bulletin*.

The Association voted that the Council of Directors be empowered to include the Yearbook as a regular or added number of the *Bulletin*, if after investigation it appears desirable to do so.

On the recommendation of the Council of Directors the Association voted to make the following changes in the By-laws: In Article VIII, Section 2, delete "Abstract Journal of the Association" and substitute "*Psychological Abstracts* and the *Psychological Bulletin*." In Article VIII, Section 2, delete ". . . may elect to receive the *Psychological Bulletin* instead of the Abstract Journal of the Association providing an additional payment of \$2.00 a year be made

to the Treasurer when the annual subscription is paid" and substitute "... will be credited with \$4.75 against a subscription to any other one of the Association's journals." In Article X, Section 3, delete entire section: "The Abstracts of papers presented at the Annual Meeting together with the report of the Secretary and Treasurer shall be printed annually and distributed to Members and Associates. The address of the President of the Association shall also be printed and distributed to Members and Associates" and substitute: "The Program of the Annual Meeting will appear as the July number of the *Psychological Bulletin* and will be distributed to the Members and Associates as described in Article VIII, Section 2. The reports of the Secretary and Treasurer shall be printed annually in the November issue of the *Psychological Bulletin*. The Presidential Address shall be printed annually in the January issue of the *Psychological Bulletin*. In Article I, Section 4, insert "and the *Psychological Bulletin*" after "*Psychological Abstracts*."

On the recommendation of the Council of Directors the Association voted to receive with thanks the report on the dissolution of the Psychological Review Company. In accepting this report it is the wish of the Association again to acknowledge its appreciation of the fact that the action just taken was in part made possible by the generosity of our fellow Member, the late Professor Howard Crosby Warren.

On the recommendation of the Council of Directors the Association voted to amend the By-laws as follows, to delete all reference to the Psychological Review Company: In Article IV, Section 7, line 27, delete "He shall also serve as Treasurer of the Psychological Review Company." In Article X, Section 4, edit the first seven lines to read as follows: "The scientific journals of the Association, *i.e.*, the *Psychological Review*, the *Psychological Bulletin*, the *Journal of Experimental Psychology*, the *Psychological Monographs*, the *Journal of Abnormal and Social Psychology*, the *Psychological Abstracts*, and any other journal shall be managed by the Council of Directors, except that the editorial policy shall reside exclusively in a Board of Editors." In Article X, Section 5, line 21, delete "He shall serve as Vice-President of the Psychological Review Company."

On the recommendation of the Council of Directors the Association voted to make the following changes in the By-laws: In Article I, Sections 1 and 4, substitute "life" for "honorary." In Article III, Section 4, line 18, insert the following statement after the word "By-laws," "In the interval between annual elections, the

Council of Directors shall have the power to fill vacancies created by the death, disability, or resignation of elected representatives to other organizations." In Article X, Section 6, line 5, insert "at the end of each calendar year" after "retiring" and delete "each year."

On the recommendation of the Council of Directors the Association voted to waive Article I, Section 4, to permit Margaret Floy Washburn to receive the status of Life Membership in the Association.

On the recommendation of the Council of Directors the Association voted to waive Article VII, Section 2, of the By-laws for 1938-1939 so as to permit representation on the Executive Committee from Stanford University and the University of California.

On the recommendation of the Council of Directors the Association voted to appoint Calvin P. Stone of Stanford University and Warner Brown of the University of California as members of the Executive Committee for 1938-1939.

On the recommendation of the Council of Directors the Association voted to rescind the action of the Association fixing dates for the 1939 Annual Meeting and empowered the Program Committee and Executive Committee to fix exact dates for the meeting in California during the week beginning Sunday, September 3, 1939.

On the recommendation of the Council of Directors the Association voted to create a Committee on Press Relations to review the experience of recent years, to study the central publicity bureau proposal of Science Service, and to make recommendations for the improvement of the handling of press relations by the Association and the local committees at the time of Annual Meetings.

On the recommendation of the Council of Directors the Association voted to appoint B. F. Skinner as Chairman, and Donald G. Paterson and Horace B. English as members of the Committee on Press Relations.

On the recommendation of the Council of Directors the Association voted to create a Committee on Scientific and Professional Ethics to consider the advisability of drafting an ethical code, the purpose of which would be to serve as a guide to Members and Associates. On the recommendation of the Council of Directors the Association voted to appoint Robert S. Woodworth as Chairman with additional members to be selected by him and approved by Council.

On the recommendation of the Council of Directors the Associ-

ation voted that the American Association for Applied Psychology, the Midwestern Psychological Association, and the Western Psychological Association be affiliated with the American Psychological Association in accordance with the provisions of Article XI of the By-laws.

The Council of Directors had received copies of resolutions protesting the holding of the next International Congress of Psychology at Vienna from various individuals and organizations including the Chicago Psychological Club, the Illinois Society of Consulting Psychologists, the Midwestern Psychological Association, the Psychologists' League, the Rocky Mountain Branch of the American Psychological Association, and the Western Psychological Association. On the recommendation of the Council of Directors the Association voted to adopt the following resolution:

Be it resolved that the American Psychological Association request the Committee in charge of arrangements for the Twelfth International Congress of Psychology to terminate, if it has not already done so, the tentative plan to hold this congress in Vienna in 1940; and that it request the Committee to arrange for the Congress in some country where the progress of psychology as a branch of science is not hindered by a government hostile to the tradition of free and unimpeded scholarship.

In the absence of L. J. O'Rourke, Walter R. Miles presented the report of the Committee on Psychology and the Public Service. The Association voted to accept the report with thanks and ordered it printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association voted to approve the Treasurer's Report for 1938 and ordered it printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association voted to approve the condensed report of the Treasurer's budget for 1939 and ordered it printed in the Proceedings. See Reports.

On the recommendation of the Council of Directors the Association voted to create a Committee on Investments with Willard L. Valentine as Chairman, and Leonard Carmichael and Samuel W. Fernberger as members.

On the recommendation of the Council of Directors the Association voted to create an Advisory Committee to work with A. T. Poffenberger and his associates in the construction of an alphabetical cumulative index for the *Psychological Index* under way with the

assistance of funds from the United States Works Progress Administration. On the recommendation of the Council of Directors it was voted to appoint A. T. Poffenberger as Chairman with Karl M. Dallenbach, C. M. Louttit, and R. R. Willoughby as members.

A question was raised from the floor concerning the possibility of securing the Yearbook at an earlier date. The Secretary explained that the present practice was to issue the Yearbook on the basis of the calendar year. New Associates and Members are given by the Constitution two months after election to qualify by paying dues, and all Associates and Members are given until December 1 to return data slips. Editorial work, printing and distribution follow. A Yearbook for the academic year would entail changes of policy. The Association voted that a study be made to determine the feasibility of issuing the Yearbook earlier than is now the practice.

Upon motion by Professor P. M. Symonds duly seconded it was voted to express the thanks of the Association to Dr. William McPherson, acting President of the Ohio State University; to Professor Harold E. Burr, member of the Executive Committee in charge of local arrangements; and to psychologists and other officers and members of the Ohio State University for the excellent plans and physical facilities provided for the Forty-sixth Annual meeting of the American Psychological Association.

The meeting adjourned at 9:40 P.M.

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## REPORTS

### REPORT OF THE PROGRAM COMMITTEE OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

August 5, 1938.

*To the Council of Directors and the Members of the American Psychological Association:*

The Program Committee was specifically charged by a vote of the membership at the annual meeting of 1937 to study the problem of coordinating the programs of the American Psychological Association and affiliated organizations and to submit a report to the Council of Directors at the 1938 meeting. The initial work of the Committee was carried on by correspondence with the secretaries and program officials of related societies and resulted in the decisions embodied in the "Call for Papers." Additional actions were taken at the physical meeting of the Committee. A copy of the special report requested has been prepared.

A physical meeting of the Program Committee was held in Dr. Burr's offices at the Ohio State University on June 4. Two hundred and sixteen paper abstracts had been sent directly to the Program Committee of the



American Psychological Association. Since three of these had also been sent to the program committees of affiliated societies, the Committee dealt directly with 213 abstracts. Of these 68 were omitted and 145 were placed on the program. A few of these were omitted because of the failure to meet technical requirements; others were omitted because of lack of program time and the expressed wish of the membership for some restriction in the length and number of sessions. The Committee also scheduled 9 papers presented by the Psychometric Society and 7 papers presented by the Society for the Psychological Study of Social Issues. A joint meeting was held with Dr. Toops and Dr. English representing the Program Committee of the American Association of Applied Psychologists. The joint committees collaborated on sessions devoted to Clinical Psychology, Industrial Psychology, Educational Psychology, and Vocational Psychology. Seventeen papers were contributed by the Program Committee of the A.A.A.P., one of which was assigned to the session on Mental Measurement.

The Committee reviewed a total of 246 abstracts, of which 178 were scheduled for the program. This is a substantial increase over 1937 and may result in some crowding. The abstracts were distributed in 21 sessions as shown in the current printed program. It was also voted to schedule round tables on Factor Analysis, Frustration as an Experimental problem, Trends in Intelligence Tests and Testing, Experimentation in Hypnosis, Testing Personality of Children, and Experimental Methods in E. S. P. Research. Fourteen films were also scheduled for a special session for Wednesday evening, September 7, 1938.

It will be recalled that the 1937 Program Committee scheduled one of the programs on a time basis with 5 minutes for discussion. Dr. Paterson circulated an Opinion Ballot on the plan and supplied the Committee with the following results:

*Results of Opinion Ballot with Reference to the Time Scheduling of Papers*

1. The scheduling for formal papers in sectional meetings on a definite time basis is so superior to the traditional method that the 1938 Program Committee should schedule all papers on a time basis.

Yes	119	54.7%
No	62	28.4%
No answer	37	16.9%

2. The scheduling of papers on a time basis in comparison with the traditional method is sufficiently advantageous to justify the 1938 Program Committee in further experimentation with this type of program scheduling.

Yes	145	66.5%
No	16	7.3%
No answer	57	26.2%

3. The method of scheduling papers on a definite time basis has so many disadvantages in comparison with the traditional method that the 1938 Program Committee should not schedule any papers on a time basis.

Yes	13	5.9%
No	115	52.8%
No answer	90	41.3%

In view of this trend of opinion the Program Committee voted to schedule all papers for the 1938 program on a time basis.

Your Committee has been impressed by the great variation in skill manifested by our membership in the writing of abstracts. These vary all the way from a brief abstract which tells clearly and concisely of the content of the paper offered to abstracts so vague and indefinite that none of the Committee were sure exactly what was proposed. The imperfections in abstract style added much to the labor of the Committee and made the Committee often uncertain of its judgment. It is quite possible that papers have been placed on the program which should not be there, and it is equally possible that papers have been omitted which should have been included. While this is regrettable, it is probably inevitable. Subsequent committees will doubtless face the same difficulties. It is recommended that future program committees make a suggestion as to the content of an abstract in the "Call for Papers." This might be accomplished in a single line such as the following, "An adequate abstract should state the problem, give the procedure, and summarize and interpret the results."

At the Chicago meeting the motion was passed that papers submitted at sectional meetings be not acceptable for the Program of the Annual Meeting, with the reservation that the action should not preclude acceptance of a paper presenting further experimental results on a topic concerning which a preliminary report was given in a previous sectional meeting. This motion was used as a basis of rejection in certain instances, but it was difficult to determine the status of a particular abstract by comparison with titles on section meetings. It is recommended that the next program committee insert a sentence such as follows in the "Call for Papers": "In case the same or a similar topic has been presented at a sectional meeting, the author of an abstract should state wherein the proposed report differs from the previous one."

It is possible that the work of the Committee might be somewhat simplified if there were two hold-over members instead of only one. The present plan of having the Secretary continue from year to year as one member of the Program Committee is obviously desirable. The suggestion here made is that there might be additional economy if one member of the Program Committee, besides the Secretary, continued for two or three years. This would make possible the capitalization of experience gained in the arrangement of a program.

In order to improve relations between the Association and the Press some individuals urged the Program Committee to insist on complete copies of papers as a condition for acceptance. Irrespective of the merits of the proposal this did not appear to be in accord with the By-laws, Article IX, Section 1.

The Committee had at hand a report on Press Relations from Dr. Skinner, press representative at the 1937 meeting, and found this helpful. After correspondence with Dr. Burrill at Ohio State the following statement was inserted in the 1938 "Call for Papers" as a step in the right direction:

*"Press Relations:* Effort is being made to improve coöperation between the Association and the Press. Press representatives wish to see complete copies of papers *before* they are delivered. Members whose papers are accepted for presentation are urged to make a copy of the manuscript available. This should be done as early as convenient because the representatives of the press can then consider the materials in advance in more leisurely fashion and prepare their stories for release the day the papers are read. More effective treatment of our program can then be secured. Manuscripts should be sent to the University News Bureau, Administration Building, Ohio State University. This bureau is operated by the University and is in charge of Mr. Schellenger, a part-time instructor in the University's Department of Journalism. The Bureau can be trusted to use good judgment in handling these manuscripts."

Respectfully submitted,

EDWARD B. GREENE

WILLARD C. OLSON

EDMUND S. CONKLIN, *Chairman*

REPORT ON THE COÖRDINATION OF THE PROGRAM OF THE AMERICAN  
PSYCHOLOGICAL ASSOCIATION WITH THAT OF OTHER SOCIETIES

August 10, 1938.

*To the Council of Directors of the American Psychological Association:*

The Association voted at the 1937 meeting that the new Program Committee be requested to study the problem of coördinating the programs of the American Psychological Association and affiliated societies and to submit a report to the Council of Directors at the 1938 meeting. This action was prompted by a resolution received from the Psychometric Society and questions raised by affiliated societies and those in the process of affiliation. A memorandum on the problems involved was circulated to the program chairmen and secretaries of affiliated societies and to the American Association for Applied Psychology, which was in the process of affiliation. Correspondence was invited from all concerned. On the basis of the correspondence decisions were made which were embodied in the "Call for Papers." Additional decisions were made at the physical meeting of the Program Committee at Ohio State University on June 4. The following guides to policy were evolved for the preparation of the 1938 program. To the extent that they meet with the approval of the Council and the membership, they may be taken as guides to future policy.

1. Upon request of the proper official of an affiliated society a brief announcement of program plans will be included in the "Call for Papers" of the American Psychological Association. The deadline for the receipt of this material will ordinarily be about the middle of April. The exact time will be fixed by the secretary of the American Psychological Association.

2. Upon request of the proper officials of an affiliated society a brief paragraph on plans will be included in the Preliminary Announcement of the American Psychological Association. The deadline is to be the same as that for the "Call for Papers."

3. No Member or Associate may submit more than one abstract whether in the American Psychological Association or in an affiliated society for papers scheduled within the official dates of the meeting. This action does not affect the arrangement of programs before or after the official dates.

4. Abstracts will be accepted only from Members or Associates of the American Psychological Association. Joint authorship will be permitted only in case both authors belong to the Association or in case the paper is read by one author who is a Member or an Associate and the other author is a trained and qualified investigator in an allied experimental science as shown by his holding membership in a national scientific society in his field.

5. The deadline for the receipt of abstracts shall be the same for the American Psychological Association and the affiliated societies. This date will ordinarily be the middle of May, the exact time to be determined each year when the "Call for Papers" is printed. Persons in charge of programs in affiliated societies will be given an additional week to organize their materials and forward them to the secretary of the American Psychological Association.

6. If it is possible for representatives of an affiliated society to appear in person at the physical meeting of the Program Committee the time for the receipt of abstracts may be made to coincide with the date of the physical meeting. This will ordinarily be about June 1.

7. All other materials intended for printing in the program of the American Psychological Association shall be received by the date of the physical meeting, about June 1. It was impractical to insist on this requirement for the current year because of the complexity of problems facing the recently organized A.A.A.P. Their Program Committee was given additional time in planning the meetings for Monday and Tuesday.

8. When an affiliated society wishes to arrange its own program within the dates of the American Psychological Association, the Committee recommends that it be permitted to do so. Such programs should be preceded by a statement similar to the following: "Program arranged by the Program Committee of the ....."

9. When abstracts pertinent to certain sessions are received both by the Committee of the American Psychological Association and by a committee of affiliated societies it is recommended that the joint committees take one of the following courses of action as seems most expedient:

a. The Program Committee of the American Psychological Association should forward to the affiliated society such abstracts as are received that fall in fields of joint interest. Such abstracts should be accompanied by a recommendation for acceptance or exclusion.

b. The Program Committee of the affiliated society should forward to the Program Committee of the American Psychological Association its abstracts with a recommendation on acceptance or rejection.

c. Representatives of the affiliated societies should send a representative or representatives to the physical meeting of the Program Committee of the American Psychological Association for the arrangement of joint sessions.

In any of the above methods the program should be preceded by the following statement: "Program arranged in collaboration with the Program Committee of the ....."

Method *c* above was employed for the 1938 program in collaboration with representatives of the American Association for Applied Psychology. This proved very satisfactory, but it is conceivable that physical conditions at times may make joint meeting impractical.

10. The Committee voted that abstract and program material for affiliated societies and the A.A.A.P. for 1938 should be printed without charge in the program of the American Psychological Association. It is recommended that the American Psychological Association continue to pay for abstracts presented during the official dates of the meeting and limited amounts in addition. This action should be reviewed if at any time the total added cost seems too large to be supported by the American Psychological Association.

The Program Committee for 1939 will no doubt wish the advice of the Council as to which plans are approved or disapproved as a guide to future policy.

Respectfully submitted,

PROGRAM COMMITTEE,

EDWARD B. GREENE

WILLARD C. OLSON

EDMUND S. CONKLIN, *Chairman*

#### REPORT OF THE COMMITTEE ON PRECAUTIONS IN ANIMAL EXPERIMENTATION

July 23, 1938.

As in former years, Dr. William C. Woodward, Director of the Bureau of Legal Medicine and Legislation, American Medical Association, undertook to inform this Committee of impending legislation which might restrict legitimate experiments with animals. We are pleased to report the apparent absence of any legislation of this nature during the past year. However, we believe it desirable that our Association continue to coöperate with the American Medical Association in the event that undesirable legislation should be proposed in the future.

In accordance with the suggestion of Dr. Culler, a copy of "Rules Regarding Animals" was sent to each department listed in the Yearbook as engaging in animal experimentation. Additional copies were sent to various other laboratories which requested them.

Dr. Paterson called to our attention a motion adopted by the Council of Directors at the Toronto meeting. The motion requested this Com-



mittee to report to the Council of Directors the name of any member who, after due warning, continued to engage in research "under conditions which do not afford every safeguard against the infliction of unnecessary suffering on the animals." No research of this nature was brought to the attention of the Committee.

Respectfully submitted,

DONALD K. ADAMS

HARRY F. HARLOW

NORMAN L. MUNN, *Chairman*

REPORT OF THE COMMITTEE ON MOTION PICTURES AND SOUND RECORDING  
DEVICES IN INSTRUCTION OF PSYCHOLOGY

August 2, 1938.

Our activities for the past year have been as follows:

1. We have continued to serve as a source of information on films available to psychologists. This work has been facilitated by an excellent review by Dr. Lester Beck, University of Oregon. (Beck, L., "A Review of Sixteen-Millimeter Films in Psychology and Allied Sciences," *PSYCHOLOGICAL BULLETIN*, 1938, Vol. 35, 127-169.) We have secured and distributed reprints of Dr. Beck's article, and have more available for any interested psychologist.

2. The report of the survey made by Dr. W. L. Valentine for the Committee, described in last year's report, has been published. Valentine, W. L., "Report of a Survey Conducted by the Motion Picture Committee," *PSYCHOLOGICAL BULLETIN*, 1938, Vol. 35, 423-429.)

3. Negotiations are under way with the Motion Picture Industry to secure prints of commercial films of psychological and ethnological interest.

4. Dr. William Hunt, Wheaton College, has been investigating the possibilities of ultra-rapid, and three-dimensional photography for various psychological problems.

5. The Committee expresses its willingness to assist program committees in any way to improve the quality of research and instructional films shown at the annual meetings.

6. Dr. Valentine and Dr. Hunt have suggested a report on techniques and equipment for the production of motion pictures, which we plan to promote.

7. The policies stated in last year's report have been continued.

Respectfully submitted,

LEONARD CARMICHAEL

EDGAR A. DOLL

WILLIAM A. HUNT

WALTER R. MILES

WILLARD L. VALENTINE

MILTON METFESSEL, *Chairman*

## THE TEACHING OF PSYCHOLOGY IN TEACHERS COLLEGES

*To the Council of Directors and Members of the American Psychological Association:*

A questionnaire in two parts, one to be filled out by the chief executive, and one by a member of the staff in psychology, was sent in March to all teachers colleges and normal schools listed in the U. S. A. Department of Interior's Educational Directory for 1938. It is estimated that these questionnaires reached 240 active institutions among the 250 listed in the directory. Replies were received from 122, or 51%, with questionnaires filled out by presidents of 115 institutions and by members of the psychology staff of 90. The following report is based upon a statistical analysis of the data made by Dr. Eva Bond.

*I. Present Status of Psychology in Teachers Colleges*

Of these institutions, 91% are publicly and 9% privately supported. Eighty-four per cent offer a four year program leading to a Bachelor's degree and 7% confer the Master's. So marked has been the tendency of normal schools to become colleges for teachers that it may be expected that in the near future practically all teachers will pursue a four year program leading to the Bachelor's degree.

Seventy per cent of the institutions have at least one person devoting full time to psychology; 85% have one or more full time persons or two or more giving half or more of their time to psychology; 62% have the equivalent of the full time of two or more persons; 24%, three or more; 9%, four or more, and 3½% five or more. In 30% of the colleges, every instructor gives one or more courses not classified in the catalogue as psychology. Many presidents commend this practice of working actively in some other field to which psychology can make a contribution. The fields are numerous: orientation in education; educational philosophy; sociology; methods of teaching; curriculum; practice teaching; methods in special subjects; supervision of practice teaching, etc.

Of those teaching psychology, 50% hold a Doctor's degree. Of these 87% have the Ph.D. and 13% the Ed.D. An additional 28% have completed one or more years work beyond the Master's; and an additional 19% hold the Master's degree, and 3% have received only the Bachelor's degree.

The highest degrees were obtained from 42 different institutions. Three or more persons received their highest degree from each of the following: Columbia, including Teachers College, 46; Iowa, 15; Peabody, 11; Stanford, 10; California, 8; Minnesota, 8; New York, 8; Michigan, 6; Pittsburgh, 6; Ohio State, 6; Chicago, 4; Clark, 4; Wisconsin, 4; Yale, 3; Missouri, 3.

Practically all teachers of psychology belong to one or more national professional or scientific societies. The National Education Association claims the largest membership, 66, followed by the A.P.A., 34. The typical instructor belongs to three national societies. During the past year, 20 attended the meeting of the A.P.A. and 50 attended one or more other conventions.

The libraries in these institutions contain from less than 25 to nearly 2,000 different books on psychology. Eight per cent have less than 100 and 5% have over 1,000; the 25 percentile is about 150, the median, 375; and the 75 percentile 550.

Seventy-one different "psychological journals" are mentioned in the list of subscriptions. The most popular are the following: *Journal of Educational Psychology*, 63; *Mental Hygiene*, 35; *Journal of Applied Psychology*, 24; *Psychological Review*, 22; *American Journal of Psychology*, 19; *Journal of Educational Research*, 17; *Psychological Abstracts*, 14; *Pedagogical Seminary and Journal of Genetic Psychology*, 14; *Journal of Abnormal and Social Psychology*, 13; *Journal of Experimental Psychology*, 12; *Journal of Social Psychology*, 11; *Psychological Bulletin*, 10; *Psychological Clinic*, 9. The most notable feature of this list is the small number of subscriptions to such journals as the *Journal of Educational Research*, *Journal of Experimental Education*, *Pedagogical Seminary*, *Journal of Genetic Psychology*, *Child Development Monographs*, and other journals launched within the last decade to deal with precisely the phases and applications of psychology which, as shown in the next section, are now judged by psychologists and executives to be most valuable to these institutions.

Of 86 institutions which gave data about clinics, 52, or 60%, reported no clinical facilities and 34, or 40%, equipment of some sort. Eleven had general educational and psychological clinical facilities of their own; five used the clinics of neighboring school systems or universities; nine had reading clinics only; five speech clinics only and 4 child guidance clinics.

Psychological laboratories and laboratory equipment for experimental psychology of some sort were found in 33, or exactly half the institutions reporting on this item. Of these, 8 appeared to be fairly complete, 10 were moderately and 15 quite incompletely equipped. Three institutions having the better equipment reported that these facilities were being decreasingly used.

Of those giving data, 55% used motion or sound motion picture apparatus in instruction. Of these, 5% reported extensive, 40% moderate, and 55% occasional use. The 16 mm. machine is used three times as often as the 35 mm. machine and only one other size was reported.

Concerning mental hygiene, 17% of the institutions made no reply, 11% reported no offerings, 22% treat this field only as part of other courses in psychology, educational psychology, child development, etc.; 40% offer one course, and 10% two or more courses. In about 4% of the institutions the course is given by a physician. Aside from work in mental hygiene and in mental and educational testing, a single course in clinical psychology is given in 7% of the institutions and of course coupled with clinical facilities in 5%.

Psychological counseling for the college students is not provided in 17% of the institutions and probably not in 14% additional whose officers disregarded this item—a total of 31%. In 17% this work is done by other officers—Deans, Guidance Departments, of the "staff as a whole." In 15% of the colleges, psychologists engage in "some" counseling with students; in 22% "considerable," and in 5% "a large amount."

Information concerning courses and facilities for diagnostic and remedial work in the language arts and other subjects was requested. "None" and no answer total 40%; specific courses given by psychologists were reported in 25% and offerings in other courses or courses by other officers in 35%. Work in this field is frequently given in the training, demonstration, or experimental schools or in courses on methods of teaching the several subjects. Diagnostic and remedial work in reading is the most frequent offering. Remedial work in speech is next and it is given by instructors in the Speech or English Department, rather than in Psychology, in 84% of the institutions having it. Remedial work in spelling, arithmetic and language is less than half as frequently offered as in reading and special remedial courses in other subjects—writing, science, etc., are very rare.

A special room, clinic or laboratory with equipment for diagnostic and remedial work is reported by one-third of the institutions. These facilities are often combined with the equipment for other types of clinical services and in others they are in the training school, the speech clinics or the quarters for tests. Equipment reported is diverse. In 10% the equipment was rather meager; in 14% fair, in 9% good.

In response to the question, how many persons are devoting half or more of their time to diagnostic and remedial work, the replies were: none or no answer, 74%; one, 13%; two, 7%; three, 3%, five, 2%; several, 1%.

In reply to the question, how many persons, if any, are giving eight or more hours per week to research, 31% of the institutions reported one or more; a total of 43 persons in 90 institutions, or approximately one person in every two institutions devote eight or more hours per week to research. Eighteen per cent of the institutions which reported that no one devoted as much as eight hours a week to research were nevertheless pursuing one or more investigations.

A list of major research projects reported as under way are classified as follows:

Methods of selecting students for the college or teaching posts.....	25
Elementary school subjects.....	18
Personality: testing, analysis, case studies, etc.....	12
Secondary school subjects.....	10
School room activities, management, methods.....	7
Child development.....	7
Adolescence.....	6
Methods of teaching psychology.....	6
Intelligence and achievement tests.....	5
Curriculum of instructor's own institution.....	5
Special groups—delinquents, negroes, etc.....	5
Social psychology.....	3
Value of motion or sound-motion pictures.....	3
Miscellaneous, reported by one or two institutions.....	22
Investigations under way but not described.....	18
Total.....	152

Study of the descriptions of projects under way gives the impression that substantial investigations are being carried on in about one-fifth of



the institutions and that probably in 15% research is definitely supported and encouraged by the administration. Although most of these institutions have certain types of facilities for research, such as easy access to schools, play groups, and other institutions, no investigations were reported in half of them. Many instructors wrote in such items as "not time for research," "teaching program too heavy," or "research not encouraged," "we are consumers of research—not producers."

## *II. Trends in the Teaching of Psychology, as Reported by the Presidents and Teachers of Psychology*

The questionnaire requested the college presidents to indicate the phases of the work of the psychology staff which they considered "most valuable" and "least valuable." The responses were tabulated as follows:

### *Work reported "Most Valuable" by college presidents:*

1. Courses, etc., on understanding the child, especially newer courses in child development, in which contacts are made with children..	25
2. Guided observation of children (course not mentioned).....	14
3. Clinical work, or case studies, or demonstrations of children's behavior.....	13
Total—for work involving observation and study of children..	50
4. Courses in personality adjustment, counseling and personnel.....	24
5. Courses in mental hygiene.....	12
6. Courses in educational and vocational guidance.....	12
Total for "personnel work".....	48
7. Diagnostic and remedial work in the school subjects.....	18
8. Other courses on school subjects.....	16
9. Tests and measurements.....	20
Total mention of school subjects.....	54
10. Analysis of learning process.....	13
11. Help in classroom management.....	9
12. Assisting the college student to understand herself.....	8
13. Assisting college student in learning how to study, read, etc.....	8
14. Field trips, visits to outside clinics, and various institutions.....	8
15. Giving students experience in methods of research.....	6

Although it was difficult in many cases to tell exactly what type of work the college presidents had in mind, it is probable that items 14 and at least a part of 8 could be included with the first group, "contact and observation," and items 12 and 13 with the second group, "personnel work." In any event, it is clear that the presidents believe that the psychologist's best services consist in enlightening the prospective teachers concerning the nature of development, both normal and abnormal, and in helping the student-teachers understand and improve themselves. Next in order is assistance in developing skill to deal with the school subjects, especially diagnostic and remedial work; next is testing and measurement. In other words, the chief executives are favorably impressed with certain more recent developments—the newer "child development" approach to child psychology, the newer types of clinical and guidance approach to the study of personality and the more recent experimental, diagnostic and remedial types of study of the school subjects. Mention of the contributions of psychology to the determination or modification of educa-



tional objectives is notably absent. Contributors to educational practice rather than to educational philosophy or social theory are commended. Only one among 115 college heads mentioned "social psychology" as such among the "most valuable" of the psychology department's offerings.

*Work reported as "Least Valuable" by college presidents:*

1. Courses in general psychology.....	15
2. Courses in theoretical psychology, controversial issues, etc.....	8
3. Physical basis: physiology of nervous system, etc.....	8
4. Sensations, perceptions, illusions and other specific topics in general psychology.....	5
5. Laboratory work in general psychology.....	4
Total.....	40
6. Courses in educational psychology, testing, etc., with insufficient professional application; "too academic," "courses for the prospective psychologist rather than for the prospective teacher".....	15
7. Courses (all kinds) without observation or participation.....	10
Total.....	25
8. Too technical; too much statistics.....	6

No other items mentioned more than once.

The reaction of the heads of teacher training institutions is quite clear. Although many made no response, objections to the courses in general psychology, in whole or in part, is the most frequent with a total of 40! The next most frequent protest is that courses in educational psychology are taught in too academic a fashion, with too little application to professional needs or in too great isolation from contacts with children.

In general, it may be said that the teachers college presidents deplore the academic, bookish type of content and teaching typical of the past and applaud the newer professionalized approach. They are particularly critical of the "general" courses both in psychology and educational psychology.

The psychologists were asked to "indicate by a check the emphasis likely to be given in your institution in the future to the items listed below." The seventeen items and the responses to them are given in the accompanying table.

Essentially the same changes are suggested for elementary and secondary teachers, supervisors and administrators. An increase in emphasis on study of personality, personality and social adjustment, and mental health of the teacher and her pupils is most frequently predicted. Vocational, educational and social guidance comes next, closely followed by actual contact with children, adults and life in the community. An increase in use of motion pictures and other such apparatus in instruction is predicted by more than five times as many institutions as feel that they use such devices sufficiently now and practically none predict a decrease. Social psychology will receive more emphasis in most institutions and less in a negligible number. The trend will be definitely toward "use of several books, articles, etc., rather than a single text." Courses in which psychology is integrated with sociology, philosophy and other subjects will increase as will psychology of the various school subjects, adult life, general methods of teaching in many institutions, although approximately

Indicate by a check the emphasis likely to be given in your institution in the future to the items listed below.

	Elementary Teachers		Secondary Teachers		Supervisors and Administrators	
	More	Satis- Less factory	More	Satis- Less factory	More	Satis- Less factory
1. Psychology applied to the teacher and her mental health, her social adjustment, her personality, as contrasted with psychology applied to the pupils, the school subjects....	67	10	40	8	24	4
2. Personality adjustment.....	60	1	41	1	24	5
3. Vocational, educational and social guidance.....	58	2	44	1	25	1
4. Actual contact with children and adults as contrasted with reading and talking about them.....	57	2	36	2	20	5
5. Actual contact with life in the community, its various institutions.....	56	2	35	1	22	5
6. Use of motion pictures and other such apparatus in instruction.....	52	10	30	1	19	2
7. Social psychology.....	45	2	24	4	15	7
8. Use of several books, articles, etc., rather than a single text	44	4	33	17	18	9
9. Integrations of psychology and other subjects, such as sociology.....	40	4	30	3	18	6
10. Psychology of particular subjects—reading, history, social studies.....	32	6	18	4	9	11
11. Psychology of adult life.....	28	3	20	2	20	6
12. Psychology of general methods of teaching.....	26	7	16	6	10	13
13. Psychology applied to the work of the school administrator, librarian, personnel officer, supervisor etc.....	21	5	8	2	13	10
14. Abnormal psychology.....	20	7	13	3	8	11
15. Tests and measurements.....	15	7	8	2	6	16
16. The schools, or systems, or major theories of psychology..	8	17	12	12	6	13
17. Topics in general psychology, such as perception, sensation, memory.....	4	28	3	13	4	13

an equal number feel satisfied with the emphasis now given to these subjects. Abnormal psychology is considered to be sufficiently emphasized by the majority and though about 30% expect it to receive more, 10% predict it will get less emphasis. Tests and measurements are judged as now receiving about the right emphasis by about 70%. A decrease, or no change in emphasis, in the treatment of major schools or systems of psychology is predicted by a large majority and a further decrease in emphasis on many of the common topics in general psychology such as sensation, perception, memory, etc., is predicted most frequently of all.

The representatives of the psychology instructional staff were requested, finally, to "describe the main changes or developments in your work which you would attempt to accomplish if you had time and facilities." Eight lines of development were mentioned by six or more institutions. They are as follows:

- |  |    |
|--|----|
| 1. Further development or establishment of educational and psychological clinics for case studies of behavior problems, social problems, personality adjustments, difficulties in reading, speech, etc. .... | 50 |
| 2. Time and facilities for more contact with and guidance of students—personnel work, educational guidance, mental hygiene, etc. ....  | 35 |
| 3. Provisions for more observation of and contacts with children in community, demonstration and experimental and public schools....   | 25 |
| 4. More opportunity for research.....  | 20 |
| 5. Better facilities for visual and audio instruction.....   | 18 |
| 6. Better equipment and facilities for laboratory and experimental work in connection with courses.....  | 12 |
| 7. Greater activity in studying and participation in community life with students.....   | 10 |
| 8. Reorganizations and integrations of work in psychology and other subjects.....  | 6  |

In the main, the types of work rated as "most valuable" by the presidents are those that the instructors would promote and believe will be given more emphasis in the future. They agree similarly about the "least valuable" lines.

A few differences appear, however. Most noticeable is the fact that, although only one president commented favorably on social psychology or the contributions of psychology to educational philosophy, the instructors predict an increase in the former and express themselves as favoring closer integrations with sociology, educational philosophy and other social disciplines. The instructors in ten institutions also expressed their desire to exercise more leadership in studying and participating in community life with their students. The presidents' omission of these items may, however, be due to the fact that they are rarely well offered in their colleges now. They were reporting on work now being done. That psychology should become more "functional" or "professional" and less academic; that its main value is "professional" rather than cultural and that in teaching the subject the students should be thought of as prospective teachers and not as prospective psychologists is a view expressed almost unanimously by the presidents and usually by the instructors.

*General Conclusions*

The Committee believes that, in planning to improve the instruction in teachers colleges in the future, the following considerations are of importance.

1. It is probable that in the near future the old type of two or three year "normal" or "training" school will be replaced by the newer types of "teachers college" requiring the completion of a four year program for the bachelor's degree for a teaching license. Many of these institutions will offer graduate work as well. There will probably be at least two hundred such colleges offering a four year program, comparable in level and thoroughness with the liberal arts colleges, within twenty years.

2. It is quite apparent in the materials (some of them confidential letters to the Committee) submitted by the presidents of these colleges, especially by the chief executives of the more progressive institutions, that many of the course offerings of their psychologists were regarded as failing to achieve the results, either in the cultural or professional development of prospective teachers which had been hoped for.

The Committee believes that the frequent conviction that much of psychology "has been tried and found wanting" is justifiable, that it is a very serious matter and that it is due chiefly to two things: (1) the appointment in the institutions of psychologists not properly equipped to serve their needs and (2) the failure of many of these institutions to provide the facilities necessary for psychologists properly to grow professionally while in service. It is recognized that there are many exceptions in one or both of these respects.

Prominent among the examples of inadequate training and equipment of persons recommended to or appointed by teachers colleges are the following: (a) Instructors whose training is quantitatively meager, such as those who have had little or no work beyond the Bachelor's or Master's degree. The Committee is convinced that three years of the best available training on the graduate level are essential to master satisfactorily the full range of information and skill essential for dealing with the complex psychological problems presented by modern education. Narrowness and naïvete in less well trained instructors are usually to be expected.

(b) Instructors whose training and experiences are qualitatively inadequate. Among these are many persons who, although they have earned a Doctorate in some phase of psychology—perhaps even with distinction—are not masters of many phases of the subject of primary importance to teachers and education. The preceding sections of this Report indicate a number of these areas in which many Doctorates in psychology are poorly informed, if not quite naïve.

(c) Instructors who are unfamiliar with the theories, objectives and practices of modern education. It is far from true that "anyone who has gone through our elementary and high schools knows what they are all about," and it is equally false that one who knows all about the schools he went through knows all about the kind of schools and education which the better teachers colleges are training their students to develop. Merely to "know" a reasonable amount about the newer objectives, the curricula, methods of teaching, guidance, of diagnostic and remedial work, etc.,

will require a thorough application of a good mind for an academic year at least. Finally, merely to know much about the primary concerns of the students in teachers colleges is rarely sufficient—experience in the classroom and contacts with the administration and operation of modern schools are also essential. In this connection, a statement of one of the Committee, Dr. Stone, may be quoted as an expression of this general view:

"A mistake is now being made in sending into our teachers colleges too many young people who have come directly up the line as graduate students and by virtue of their aptness for college work and their general promise as teachers, are sent out to handle the instruction in subjects dealing with the application of psychology to the public schools. I think that psychology departments are no more at fault in this matter than education departments, because there is a growing tendency for them to take the Ph.D. type of individual who has hardly seen a school room since his high school days, and set him up as a proper teacher for those who are going to handle school problems. It seems to me that we must send our young people out into the public schools to serve an apprenticeship and then possibly bring them back to college to give them a chance to strengthen their preparation along lines that appeal to them."

The Committee is convinced by its survey that the administrations of many teachers colleges are not free of responsibility for the deficiencies in the instruction of the psychologists. They must share responsibility for appointing improperly trained persons as instructors. The heavy teaching burden imposed by many institutions on both poorly and well equipped instructors makes it difficult for them to grow professionally. In many institutions, facilities for professional growth are inadequate. We noted earlier the inadequate list of journals and monographs, especially of the more recent periodicals dealing with precisely the subjects which the presidents consider of greatest importance. If the book list is equally inadequate, the need of a reform in the interests of both students and staff is imperative. The unsatisfactory character of clinics, testing and examining rooms, and, in general, of equipment and materials for the study of individuals and groups of the types desired by both the presidents and instructors is apparent in the questionnaire returns.

3. Finally, the Committee believes that the infrequency of adequate provisions for creative work and research is responsible in some degree for deficiencies in instruction. While it is recognized that many lines of research yield results of little immediate or even remote professional value, either in the form of experience for the instructor or in the form of data applicable to important educational problems, many other types may be of great value in both respects. When the instructor senses crucial educational problems in his own institution and undertakes research to yield the solutions which he and his students need in their professional work, he will be pursuing activities which can hardly be excelled as means of increasing his own usefulness as a teacher. It is proper to deplore narrow, trivial or "academic" research, but unwise not to support investigations of professionally vital problems. The teachers colleges, moreover, are notably well equipped to foster precisely



this type of research. As one of the members of this Committee stated, "An effort should be made to get more research projects allocated to teachers colleges which have associated with them training schools, or which have good connections with the public schools. I am more and more impressed with the desirability of having research on children done in such conditions, as opposed to the sporadic sallies made by university professors into school districts. The latter are not able to maintain their contacts sufficiently long to carry out projects which are of vital importance in research on adolescent children, primary children, etc. It seems to me that in the future we might expect the best results to come from research projects carried on in teacher training schools if only proper facilities can be set up. No doubt money will have to be gotten from the outside because we cannot expect the budgets of teachers colleges to carry good research programs in modern times."

#### *Recommendations*

The Committee believes that the data gathered in this investigation justify the following recommendations:

1. It is recommended that the teachers colleges should exercise greater care to appoint as instructors in psychology only persons adequately trained for the work they are asked to do. It is recommended that three years of first class graduate work be considered essential for any important teaching post. It should be recognized, furthermore, that even the Ph.D. degree in psychology is no guarantee that a person is competent in all phases in psychology. For work in clinical psychology (case studies of normal and maladjusted persons), for example, a Ph.D. degree, or success in teaching psychology, or research, or ability in tests and measurements, or familiarity with abnormal psychology, etc., does not necessarily indicate competence. It is recommended, furthermore, that lack of experience in teaching be considered as probably a serious limitation in the equipment of a teacher of psychology in a teachers college.

2. It is recommended that the departments of psychology and educational psychology in the universities assume a full share of responsibility for recommending to teachers colleges only those well equipped to do their tasks competently. It should be recognized, for example, that familiarity with the problems and practices of modern education and the work of teachers is essential to the successful application of psychology to teaching. It should be realized, to give another example, that few institutions now provide a satisfactory program of training and experience for developing high competence in the clinical study of all types of children and adolescents, such as emotionally unstable, neuropathic and psychopathic, various types of physical and mental handicaps, specialized educational disabilities, etc., in which the teachers colleges are interested. It is especially recommended that an appropriate group undertake (a) to investigate the programs of training now existing in American universities, and (b) to draw up specifications of desirable courses of advanced study, and (c) to pursue further its efforts to develop a form of certification which will be helpful to teacher training institutions.

3. The Committee recommends that the administrative and the psychology staff of the teachers college confer and coöperate in efforts to improve the services of the latter in several lines which have been very fruitful in certain progressive institutions. In particular there seems to be need for:

(a) More opportunity for research, especially on professional problems. The Committee recommends that the possibilities of getting support from various Foundations for research in teachers colleges be carefully explored.

(b) More opportunity for guiding students in their observation of and participation in the schools, clinics and other institutions.

(c) Better laboratories and clinics.

(d) Better library facilities. The Committee believes that some of the Foundations might be interested in assisting in improving the libraries of teachers colleges.

(e) More activity in experimenting with new and different methods of organizing and teaching psychology.

(f) More participation in the activities of the American Psychological Association and its affiliates.

4. As one means of fostering all the aforementioned purposes, the Committee recommends (1) that one thousand copies of this report be printed and distributed to presidents and teachers of psychology in all teacher training institutions; (2) that information concerning the membership in the American Psychological Association and affiliated societies be sent to those teaching psychology in these institutions and that the latter be invited to apply for membership.

5. Finally, it is recommended that the program committee of the Association and its Divisions attempt to organize round table discussions and other meetings at which the problems of the teachers colleges may be discussed.

Respectfully submitted,

ARTHUR I. GATES

CALVIN P. STONE

GOODWIN B. WATSON, *Chairman*

COMMITTEE ON SECURING FINANCIAL SUPPORT FOR THE CONTINUATION  
OF *Psychological Abstracts*

July 23, 1938.

The Committee on Securing Financial Support for the Continuation of *Psychological Abstracts* begs to report that during the past year it has taken the final step that seemed necessary with regard to its previous request for a grant to the Association for continuing the *Abstracts*. This request, submitted to the Rockefeller Foundation in 1935 and appreciatively considered at that time, but not granted, will remain on file at the Foundation with the understanding that it may be renewed by the

Association if a situation should arise endangering the further publication of the *Abstracts*. For the present, in the opinion of your Committee, no further efforts need be made to secure financial assistance, and the Committee accordingly asks to be discharged.

Respectfully submitted,

WALTER S. HUNTER  
LEONARD CARMICHAEL  
HERBERT S. LANGFELD  
ROBERT S. WOODWORTH, *Chairman*

REPORT OF THE REPRESENTATIVES OF THE AMERICAN PSYCHOLOGICAL  
ASSOCIATION TO THE COUNCIL OF THE AMERICAN ASSOCIATION  
FOR THE ADVANCEMENT OF SCIENCE

August 10, 1938.

As elected representatives of the American Psychological Association on the Council of the A.A.A.S., we have the honor of making the following report concerning matters which came before the Council and which might be of interest to the American Psychological Association.

In line with the policy announced by the Permanent Secretary, Dr. F. R. Moulton, the Executive Committee proposed to the Council that the objects of the Association be expanded to include the diffusion of scientific data to lay groups. The central idea was to allow the Association to take an active part in the establishment of serviceable relations between science and social culture. Since this new policy would require an additional statement in the constitution and therefore a constitutional amendment, formal action could not be taken at this meeting, but will presumably occur at the next summer meetings.

With a similar objective, it was voted to extend to students in secondary schools and to other persons under twenty-one years of age, the rank of junior membership at \$1.00 per annum without entrance fee. At present such members would receive the four issues of *Science* which are particularly concerned with the annual meeting. Ultimately a new periodical written especially for junior members may become available.

The Standing Committee of the Association on the Place of Science in Education was authorized to make preliminary arrangements for conducting a survey of the teaching of science at the college level. After considerable discussion as to which sciences should be surveyed, during which a number of speakers questioned the status of mathematics, the social and economic sciences, and the historical and philological sciences, members of the Executive Committee believed that the survey should include the sciences represented by all the sections of the Association. It is significant that no one questioned the status of psychology as a science in this discussion.

Three resolutions were passed, one clarifying the conditions of Cattell's gift of *Science* to the Association, another relating to land utilization, and a third regarding publication of certain symposia.

We should like to report that the participation of psychologists in the discussions during meetings of the Council is a very happy arrangement giving opportunity as it does, for the continued recognition of psychology as a science and contributing on occasion unique but important angles to subjects under discussion.

Respectfully submitted,

WALTER R. MILES

CHRISTIAN A. RUCKMICK

REPORT OF THE REPRESENTATIVE OF THE AMERICAN PSYCHOLOGICAL  
ASSOCIATION ON THE AMERICAN DOCUMENTATION INSTITUTE

July 25, 1938.

The first formal meeting of the American Documentation Institute was held January 27, 1938, in Washington. Although your representative could not attend the meeting, a complete report on it has been received. Some fifty scientific and scholarly societies are participating in the American Documentation Institute, which has taken over the work formerly done by Science Service's Documentation Division, chiefly Bibliofilm Service and the Auxiliary Publication Division. The service is microfilming of documents, books, manuscripts, etc. New instruments have been designed, both for the photographing of documents on microfilm and for reading microfilms. The service operates on a coöperative basis without the burden of private profit. It is hoped to extend the service to all intellectual journals that wish to coöperate and to stimulate microfilming in libraries generally in order that an intellectual worker may obtain simply, easily, and at a predetermined price the microfilming of any material from any library in the world. Coöperation with similar agencies in other countries is being undertaken.

The following brief announcement has been issued by the Service for acquainting constituent Societies with the work of the Institute, "At the recent annual meeting of the American Documentation Institute, held in Washington, D. C., it was announced to the nominees of fifty national learned societies who constitute its membership that A.D.I. is now operating the non-profit Bibliofilm Service in three Washington libraries, that of the U. S. Department of Agriculture, the Army Medical Library, and the Library of Congress.

Scholars and libraries desiring to have printed or manuscript material copies may have this copying done upon 35-millimeter photographic negative film, or in the form of a legible photoprint made by enlargement from the negative. The cost is 1 cent per page for film or 10 cents per page for photoprints, plus a fixed charge of 20 cents per item.

Bibliofilm Service began in 1934 and the volume of material copied for scholars has doubled each year. In all, some 2,500 scholars have been served with approximately 7,000 items, totaling hundreds of thousands of pages. Through the vision of Miss Claribel R. Barnett, Librarian of the United States Department of Agriculture, that library was put in the front rank in its ability to supply this up to date service, with the essential

coöperation and inventive genius of Dr. Atherton Seidell of the National Institute of Health, and of Lt. R. H. Draeger, M.C., U.S.N., Naval Medical School, and the organizing ability of Mr. Watson Davis, Director of Science Service.

In the early stages adequate mechanisms had to be invented and constructed, and this pioneer development was likewise a coöperation, between Science Service, the Chemical Foundation, the Rockefeller Foundation, the U. S. Navy, the Department of Agriculture Library, the Bureau of the Census, the Works Progress Administration, and the Library of Congress.

No copying at low cost was possible until an adequate automatic machine was created, equipped with a carriage which would adjust automatically to bring both pages of an opened book in the same flat plane, and operated by simple touch of an electric button permitting work to be run through with speed and accuracy. The result was the building at a cost of several thousand dollars of the special Draeger copying camera installed in the Bibliform laboratories, where two more advanced Draegers are being constructed. For use by the individual and libraries an adequate reading machine at a reasonable price was also needed, and that was developed. It has been turned over to commercial manufacture, as American Documentation Institute and its Bibliform Service do not engage in the sale of mechanisms.

Editors of learned journals can lessen the strain on their budgets by making use of the Auxiliary Publication Service operated by American Documentation Institute, which makes available microfilm and photographs of typescript and illustrative material deposited with American Documentation Institute."

Any psychologist who is interested in the utilization of this service and its cost can obtain information and printed forms and statements by writing to the Bibliform Service, American Documentation Institute, c/o Library of U. S. Department of Agriculture, Washington, D. C.

Respectfully submitted,

JOHN E. ANDERSON

#### REPORT OF THE DELEGATES OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION TO THE INTER-SOCIETY COLOR COUNCIL

The Inter-Society Color Council has continued the various projects previously reported, some of them to completion, and has undertaken new activities of interest to its member bodies.

(1) The definition of color terms has been completed with the exception of those proposed by the Optical Society of America, which await the completion of the report of the Colorimetry Committee of that body. In any case, it is planned to make the material available shortly.

(2) The Problems Committee has undertaken a statistical study of the relation of the I.S.C.C. system of color names to common usage, with a view to making the former conform with the latter, at the same time eliminating the vagaries of the latter.



(3) The Committee whose problem is a more accurate relocation of the color samples of the "Munsell System" has reported satisfactory progress.

(4) The "Who's Who in Color" has been published in Lithoprint form. It will be furnished shortly to all delegates and individual members gratis, and will be available to others at a moderate cost.

(5) The Boston Color Group sponsored by the I.S.C.C. has been successful and active, and the Executive Committee of the Council has outlined plans to promote additional local groups.

(6) The News Letter encountered financial and consequent editorial difficulties. The Executive Committee devoted considerable time to these problems at a recent meeting and feels that the difficulties have been solved. It is hoped that an important commercial establishment, acting as a sustaining member, will take charge of the publication of the News Letter, thus assuring its prompt and frequent appearance. Two members of the Council who have had considerable experience in the field, have volunteered their services to assist the present editor. We believe that the outcome will be a valuable organ of contact between member bodies, delegates and local groups.

(7) The I.S.C.C. has broadened the scope of its annual meetings and the results have been gratifying. For two years, evening lectures of general interest on color have been arranged. At the 1938 meeting which was held on February 24, the afternoon session was devoted to a series of invited papers on the development, description and use of the photo-electric spectrophotometer. The Optical Society sponsored the session and is devoting an issue of its Journal to the publication of the papers. Copies will be furnished to delegates and members of the I.S.C.C. The program of the Physical Society carried an announcement of the meeting. The Electrical Testing Laboratories acted as hosts and published in mimeographed form and distributed the papers presented at the evening session. The first evening paper was psychological in character and was presented by the chairman of your delegation. Some 200 persons were present at the afternoon session and 300 at the evening.

(8) The Executive Committee has voted to invite the American Psychological Association to sponsor the technical session of the 1939 meeting, and to secure the coöperation of other member bodies which will be meeting at the same time to act as co-sponsors and hosts. It has designated one of the A.P.A. delegates to arrange the program of the technical session.

#### *Activities of the A.P.A. Delegates*

Your delegation has taken an active part in the work of the council. Five delegates were present at the last annual meeting. The delegation has been represented on the committee which prepared the "Who's Who in Color," on the one which is revising the "Munsell System," among the organizers of the Boston group, on the program committee for 1939, on the program of the 1938 meeting, and in the chairmanship of the Council for the years 1938 and 1939.

Your delegation to the Inter-Society Color Council recommends:

- (1) That the A.P.A. continue its membership in the I.S.C.C.
  - (2) That the A.P.A. accept the invitation of the I.S.C.C. to act as sponsor, without financial obligation, of the 1939 meeting of the I.S.C.C.
  - (3) That the present vacancy on the delegation be continued.
- Although several names have been mentioned, your delegates are of the opinion that before consideration a candidate should express his interest in the I.S.C.C. and his desire to become a delegate. It seems proper that any member of the A.P.A. so express himself to one of the present delegates or to a member of the Executive Committee of the A.P.A.

Respectfully submitted,

FORREST LEE DIMMICK, *Chairman*  
 SIDNEY M. NEWHALL, *Voting Delegate*  
 MICHAEL J. ZIGLER, *Voting Delegate*  
 FRANK A. GELDARD  
 CLARENCE H. GRAHAM  
 JOY P. GUILFORD  
 HARRY HELSON  
 THEODORE F. KARWOSKI  
 ELSIE MURRAY

#### REPORT ON THE DIVISION OF ANTHROPOLOGY AND PSYCHOLOGY OF THE NATIONAL RESEARCH COUNCIL

July 27, 1938.

The National Research Council affords our Association valuable contacts with other scientific groups and enables us to participate in joint programs of research. Several committees of the Division of Anthropology and Psychology are dealing with such borderland fields.

The Committee on Psychology of the Highway has coöperated with the Highway Research Board—mostly an engineering group—in the study of highway safety, and foresees a continuing demand for psychological participation along the lines of aptitude testing, the analysis of accident statistics, the effects of fatigue and alcohol, and the limitations of night vision.

The Committee on Child Development represents physical growth and nutrition, pediatrics, psychiatry, and sociology, as well as psychology. Its major activities have been handed over to the Society for Research in Child Development, but the National Research Council continues to afford a home for this work in the form of office space and care of certain funds granted the Society for inaugurating a publication program. The Society is seeking to increase its membership from the several scientific groups so as to insure the permanence of the *Journal*, the *Monographs*, and the *Abstracts* of Child Development.

The Committee on Problems of Neurotic Behavior unites psychology, physiology and medicine and has good prospects of developing some incisive research on these baffling problems. This Committee plans to launch in 1939 a journal devoted to research in psychological medicine.

Similarly, the Committees on Auditory Deficiency and on Personality in Relation to Culture have a borderland character; and the same is true of some committees set up under other Divisions of the Council: those on Human Heredity, on Research in Problems of Sex, and on Scientific Aids to Learning, psychology being represented on each of these committees.

From the accumulated royalties of the National Intelligence Tests the Division has been able to make up a number of grants-in-aid, totaling about \$1,160 for 1937-1938, for psychological and anthropological research.

The funds available for National Research Fellowships in the Natural Sciences provide for fewer appointments than formerly. The awards are now made by a single board for all the natural sciences except Medicine. Only 2 psychological appointments have been made for the current year—a number which may appear small in comparison with the 5 appointments in Physics, 5 in Chemistry, 6 in Botany, and 6 in Zoölogy. However, there were only 8 candidates in Psychology and our percentage of successes is greater than in the other sciences, being 25 as against a total of 20 per cent. These Fellowships may prove to be useful in preparing competent workers in the borderland fields.

The newly elected Chairman of the Division is an anthropologist, Professor Carl E. Guthe of the University of Michigan, and the Vice-Chairman is our member, Harry M. Johnson of Tulane University.

R. S. WOODWORTH

REPORT TO THE AMERICAN PSYCHOLOGICAL ASSOCIATION OF ITS  
REPRESENTATIVES ON THE SOCIAL SCIENCE RESEARCH COUNCIL

July 20, 1938.

During 1937-1938 the Association's representatives on the Social Science Research Council have been A. T. Poffenberger, M. A. May, and G. W. Allport. Of special interest are the following activities of the Council.

Its Committee on Personality and Culture (M. A. May, Chairman) has sponsored four investigations of the type called "nuclear research." The first of these, a study of Coöperative and Competitive Behavior, has been previously reported to the Association. Its favorable reception has encouraged the Council to undertake other investigations along the same lines. Recently completed and published is T. Sellin's report on "Cultural Conflict and Crime"; in process are reports on acculturation by R. Linton, M. Herskovits, and R. Redfield; and a study by L. Wirth on cultural hybrids. Continuing the same plan for nuclear investigation the Council is now considering additional topics for study, among them the influence of dependency upon personality, cultural influence on intelligence in relation to age and initial endowment, the possibilities of improving inventories and schedules used in the study of personality, and basic factors underlying group discussion. The latter subject relates especially

to a lively interest of the Council in conference procedure, and more particularly to a preliminary report on conference procedure made to the Council a year ago by F. S. Chapin. All of these proposed topics for exploration are of considerable interest to psychologists, although it is impossible as yet to tell upon which ones the Council may embark. To advance further the work of the Committee on Personality and Culture the Council is planning a joint meeting between this committee and the corresponding committee of the National Research Council in the coming fall or winter.

The Council has appointed Q. McNemar to undertake a study of the nature of adequate sampling in psychological research, and R. E. Arrington to report on methods of controlled investigation used in social science.

During the year the Council gave considerable attention to the possibility of rigid appraisal of research in social science, hoping to throw light on the question of why research in social science is not additive and cumulative as in natural science, but fragmentary and often unverifiable. A Committee on Appraisal has been created for the purpose of examining the character and influence of certain outstanding pieces of research in social science since the Great War. Among the studies chosen for systematic analysis is "The Polish Peasant" of Thomas and Znaniecki. None of the studies yet chosen are of a distinctly psychological character, but it is hoped that some may be added to the list.

The Chairman of the Committee on Social Science Personnel, C. C. Brigham, is continuing a follow-up of all candidates who took the examination for the first-year graduate study fellowships in 1935. The study of aptitude for creative work in the social sciences is, of course, of equal concern to the Council and to this Association.

Your representatives have taken some steps to inquire into the reasons for the relatively slight representation of psychologists among the present holders of Council grants. For the year 1937-1938, of the 13 post-doctoral research fellows, one was a psychologist; of the 34 pre-doctoral fellows, 2 were psychologists; and of the 45 recipients of grants-in-aid, 2 were psychologists. It may perhaps be questioned whether this representation is in reality disproportionately small. Psychology is only in part a social science; its interests are served as well by other councils and foundations concerned with natural and biological science. On the other hand, it is a fact that the number of qualified psychologists who apply for the fellowships and grants of the S.S.R.C. is definitely small. It would no doubt be to the advantage of our members and associates to familiarize themselves with the resources of the Council for training fellowships (pre-doctoral, field, and post-doctoral) and for grants-in-aid to research. As an assurance of impartiality in awards it may be pointed out that the chairmen of both the Committee on Fellowships (C. C. Brigham) and of the Committee on Grants-in-Aid (W. R. Miles) are themselves psychologists.

GORDON W. ALLPORT  
A. T. POFFENBERGER  
M. A. MAY

REPORT OF THE COMMITTEE ON PSYCHOLOGY AND THE PUBLIC SERVICE  
OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

September 6, 1938.

At its last meeting the American Psychological Association approved the Committee's recommendation that an attempt be made to encourage the setting up of uniform specifications for professional positions by Federal, states, and municipal civil service commissions. It was recognized that this is essential to attract well-qualified students to the public service and to permit universities to train for the interest of the service. It was further recognized that lack of definite specifications and conflicting specifications handicapped the universities in giving such training and the government in attracting people with desirable training and qualifications.

Encouraged by the interest of the American Psychological Association and of several university presidents, members of the American Psychological Association, a meeting was called by the chairman of your Committee, acting in his official capacity of Director of Research of the U. S. Civil Service Commission, of Federal, state, and municipal representatives, and a permanent committee dedicated to this objective was established.

In view of the large number of engineering and public health people, committees were set up in these two fields, and a set of specifications was developed in a coöperative test program carried out in the field of engineering with a follow-up criterion of those who had been in the service two years. In these two fields, improved specifications and selection methods are certain to result.

With the establishment of such a committee and agreement within the Federal, state, and municipal commissions as to the desirability of such a procedure, the Committee on Psychology and the Public Service of the American Psychological Association should make specific recommendations for the Federal, state, and municipal commissions in regard to positions for which psychology should be a requirement or should receive special credit. The committee should select specific positions for which it feels psychology should be a ratable element or receive special credit. At present, most commissions in announcing personnel-officer examinations list political science and economics as either required subjects or subjects which will receive special credit, but do not list a knowledge of human relations. Psychology is not recognized as important in this field of human relations. The committee might well make a study of the extent to which psychology is so taught as to prepare students to function as personnel directors with a knowledge of human relations and then make this information available to Federal, state, and municipal commissions. The American Psychological Association should recognize that industrial relations, human relations, is now being recognized by industry on a par with sales manager and production manager in salary and title, and that government is following this lead through the new executive orders of the President. This presents a challenge to the



American Psychological Association to see that such courses are given in psychology and information regarding them is made available to Federal, state, and municipal commissions in order that they may be listed as requirements in the specifications and examination announcements. Your Committee has been invited to attend a meeting of the National Assembly of Civil Service Commissions from October 17 to 21, to discuss announcements which are to or should include psychology for examinations for the public service.

The Committee wishes to call attention to the new examination for Director of Personnel in the Federal service, ranging from \$3,800 to \$6,500. Other examinations for technicians in the public service will be announced during the coming year which should be extremely attractive to students of psychology. However, unless the commissions are thoroughly aware of the courses offered and their value, they will not appear either as requirements or as subjects for special credit in the examinations when announced. Today as never before both industry and government recognize the importance of human relations, but are not aware of what psychology has to offer.

If it is the desire of the American Psychological Association, the Committee will be willing to continue its participation in this program, but in this event, requests that members of the American Psychological Association who would be willing to assist the Committee in this work and to review specific announcements so inform the Committee.

Respectfully submitted,

HAROLD E. BURTT

WALTER R. MILES

L. J. O'ROURKE, *Chairman*

#### TREASURER'S REPORT

September, 1938.

I am transmitting herewith the audited accounts of the Treasurer's Office and of the publications of the American Psychological Association for the period from January 1, 1937, to December 31, 1937.

	<i>Receipts</i>	<i>Expenditures</i>	<i>Balance</i>
Treasurer's Office .....	\$15,997.42	\$14,677.06	\$1,320.36
Publications .....	38,179.88	36,926.17	1,253.71

Since the inception of the American Psychological Association the system of accounting has been on a cash receipts and disbursements basis. This system can never give a true picture of the actual condition of the Association's publications because it merely presents an accounting of the cash received and the cash spent. It does not show the operating results of the transactions during a given period since there is overlap-

ping from one period to another. It frequently happens that the bills for the latter part of the fiscal year do not come in until after that year's records on the books have been closed. As a consequence, the payment of these bills is made in a period subsequent to the one in which the indebtedness was incurred and shows up as a disbursement in a period which should not be affected by the expenditure. Also, receipts for subscriptions and dues for one period come in the latter part of the preceding period, but the receipts show up on the records of the period in which they were taken in rather than in the period which is actually affected.

In order to present a statement of the actual financial condition of the publications for a period which coincides with the beginning and end of a volume, it will be necessary to put the accounting system on an accrual basis. With this system in operation all the expenses incurred for one volume will be shown and all the receipts for that volume will be presented. Then, the balance between them will show the exact status of that journal for a given period. The auditors strongly recommended this system when they made their 1937 financial report. As a matter of fact, they tried to present in that report a better statement of the condition of the journals than appeared on the books and in so doing shifted some of the receipts from 1937 to 1936 and made the condition of two of the journals (*Abstracts* and *Abnormal*) appear much worse than it is because they could not make all the adjustments necessary to give an accurate statement. In the next financial report, when we have made all the adjustments and have sifted out only those expenditures and receipts for 1938, the condition of the journals will be represented much more accurately. Only when we have an accurate statement of the financial condition of the journals, will we be able to determine the causes for the existing deficits in some of them.

While it is important to have the fiscal year end when the volumes of the journals are concluded, namely December 31, it does seem more advantageous to have the financial report for that period appear in the Proceedings of the Association in the November BULLETIN rather than in the March BULLETIN. In the first place, a report of all the activities of the Association for a given year should be in one place. A second reason for this recommendation is that in the period from November through March the pressure of work in the Business Office is at its peak. Then the subscriptions and dues pour in and the recording of these, the correspondence, and other transactions connected with them require the full time of the clerical force. In order to have the financial report published in the March issue of the BULLETIN, the copy should be in the printer's hands by February 1. It is extremely difficult to prepare a financial report, have it audited, and in the printer's hands by February 1 when the full time of the clerical force is needed for the daily routine transactions. If the financial report is published in the November BULLETIN, the preparation of it can be postponed until the pressure of the transactions during the busiest months has subsided. The auditors agree that this procedure will increase the efficiency of the Business Office.

## CONDENSED REPORT OF EXAMINATION

AMERICAN PSYCHOLOGICAL ASSOCIATION, INC., AND  
PSYCHOLOGICAL REVIEW COMPANY

Year Ended December 31, 1937

June 7, 1938.

*Auditor's Certificate**American Psychological Association, Inc.:*

We have made an examination of the records pertaining to the cash receipts and disbursements of American Psychological Association, Inc., and of the various publications of the Association and of the Psychological Review Company for the year ended December 31, 1937.

Included herein are statements of cash receipts and disbursements for the year, showing the sources of receipts and nature of disbursements as shown by the records and statements submitted to us. The attached statement of condition of the Association and attached balance sheet of the Company, as at December 31, 1937, have been prepared by us from the records examined and information submitted to us; no general ledger records are maintained by the Association or by the Company.

Demand deposits and savings accounts were substantiated by reconciliation of the amounts reported to us by the depositories with the balances shown by the records and office funds were accounted for. Cash transactions for the year were examined to the extent that the aggregate of recorded receipts was traced into bank deposits as shown by bank statements on file and recorded disbursements, through bank accounts, were found to be supported by signed and cancelled bank checks with the exception of checks shown by the records as outstanding at December 31, 1937. Invoices, receipts or other data on file were also examined as further support of the recorded disbursements for the year.

United States Treasury bonds in the principal amount of \$12,000.00 were submitted for our inspection. Income receivable during the year from the bonds was accounted for as having been received.

Subscriptions receivable and accounts receivable are included herein in amounts shown by memoranda or other data submitted to us without verification by direct communication with the debtors.

Stock certificates representing the Association's ownership of the entire outstanding capital stock of the Psychological Review Company were submitted for our inspection. The carrying value (\$1,800.83) of this stock in the Association's statement of condition represents its equity in the Company's net tangible assets.

In conformity with balance sheets of Psychological Review Company submitted in prior years a value of \$5,500.00 has been placed on back numbers, etc., in the accompanying balance sheet.

All ascertained liabilities have been provided for in the preparation

of the statement of condition of the Association and balance sheet of the Company. The computation of unexpired subscriptions was test checked by us.

We were advised that certain funds of the Association were reserved for specific purposes and were not to be considered as part of the Association's general funds. Cash in the amount of \$2,803.00 carried in a special account in Peoples Savings Bank in Providence represented the unexpended balance of subscriptions by members for the entertainment of foreign delegates to an international meeting in 1932 plus accumulated interest thereon to December 31, 1937. Under the terms of the gift by which the Association acquired the *Journal of Abnormal and Social Psychology*, any surplus funds arising from its publication should be used solely for purposes of that journal. The amount of such surplus funds was determined as follows:

Cash balances December 31, 1937.....	\$3,784.57
Subscriptions receivable less reserve.....	25.42
	<hr/>
	\$3,809.99
Less unexpired subscriptions.....	1,378.80
	<hr/>
Surplus funds December 31, 1937.....	<u>\$2,431.19</u>

ERNST & ERNST

*Certified Public Accountants*

CONSOLIDATED STATEMENT OF CONDITION  
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC., AND PSYCHOLOGICAL REVIEW COMPANY

December 31, 1937

ASSETS

	Consolidated	Eliminations	American Psychological Association, Inc.	Psychological Review Company
Cash on deposit.....	\$50,123.37		\$41,493.40	\$8,629.97
U. S. Treasury Bonds—at cost (market value \$12,841.25).....	12,000.00		12,000.00	
Accounts receivable (less \$124.16).....	386.44		28.89	357.55
Association's equity in net tangible assets of Psychological Review Company.....		\$1,800.83	1,800.83	
Intangibles—value placed on back numbers, etc.....		5,500.00		5,500.00
	<u>\$62,509.81</u>	<u>\$7,300.83</u>	<u>\$55,323.12</u>	<u>\$14,487.52</u>

LIABILITIES

Accounts payable.....	\$1,525.07			\$1,525.07
Unexpired subscriptions.....	14,585.06		\$8,923.44	5,661.62
Funds reserved for special purposes.....	5,234.19		5,234.19	
Capital stock.....		\$5,500.00		5,500.00
Surplus.....	41,165.49	1,800.83	41,165.49	1,800.83
	<u>\$62,509.81</u>	<u>\$7,300.83</u>	<u>\$55,323.12</u>	<u>\$14,487.52</u>



CASH RECEIPTS AND DISBURSEMENTS  
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC., AND PSYCHOLOGICAL REVIEW COMPANY  
Year Ended December 31, 1937

RECEIPTS		Combined	American Psychological Association, Inc.	Psychological Review Company
Dues.....	Subscriptions paid by Treasurer's Office.....			
	Other subscriptions.....	\$15,041.00	\$15,041.00	
Reprints, back numbers, commissions, etc.....	Interest.....	8,271.00	8,271.00	
Advertisements.....	Miscellaneous sales, refunds, etc.....	19,217.29	6,418.65	\$12,798.64
		9,653.90	728.53	8,925.37
		1,059.37	957.11	102.26
		536.80	506.80	30.00
		397.94	225.90	172.04
TOTAL RECEIPTS.....		\$54,177.30	\$32,148.99	\$22,028.31
DISBURSEMENTS		Combined	American Psychological Association, Inc.	Psychological Review Company
Printing and mailing.....	Compensation to officers, editors and employees.....	\$26,039.12	\$9,034.34	\$17,004.78
Paid to authors for prior year.....	A.P.A. subscriptions to Abstracts and Bulletin.....	10,960.24	8,926.94	2,033.30
	Office and miscellaneous expense.....	886.90		886.90
	Moving Business Office from Princeton, N. J., to Columbus, Ohio.....	8,477.00	8,477.00	
	Yearbook, reprints, annual meeting and committee expenses.....	2,443.68	2,033.32	410.36
	Refund to Laura Spelman Rockefeller Memorial Fund.....	496.02	496.02	
		2,290.59	2,290.59	
		9.68	9.68	
TOTAL DISBURSEMENTS.....		\$51,603.23	\$31,267.89	\$20,335.34
NET RECEIPTS.....		\$2,574.07	\$881.10	\$1,692.97
CASH BALANCE at beginning of period.....		47,549.30	40,612.30	6,937.00
CASH BALANCE—December 31, 1937.....		\$50,123.37	\$41,493.40	\$8,629.97
NET RECEIPTS—BY DIVISIONS		Combined	American Psychological Association, Inc.	Psychological Review Company
Treasurer's Office.....	Journal of Abnormal and Social Psychology.....	\$1,320.36	\$1,320.36	
Psychological Abstracts.....	Psychological Review.....	115.17	115.17	
Psychological Bulletin.....	Psychological Bulletin.....	324.09	324.09	
Journal of Experimental Psychology.....	Journal of Experimental Psychology.....	898.76		\$898.76
Psychological Index.....	Psychological Index.....	443.18		443.18
Psychological Monographs.....	Psychological Monographs.....	283.17		283.17
		276.25		276.25
		1,244.31		1,244.31
		\$2,574.07	\$881.10	\$1,692.97

## BUDGET FOR 1939

## TREASURER'S OFFICE

## AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.

*Estimated Income*

Interest on bonds and savings accounts.....	\$840.00
Dues.....	16,200.00
Sale of programs, Yearbooks, etc. ....	100.00
Total Estimated Income.....	<u>\$17,140.00</u>

*Estimated Expenditures*

Printing and supplies.....	\$400.00
Postage and express.....	650.00
Telephone and telegraph.....	10.00
Cost of printing Proceedings.....	250.00
Yearbook.....	700.00
Treasurer's bond, safe deposit box and P. O. box.....	95.00
Secretary's stipend.....	1,500.00
Treasurer's stipend.....	400.00
Incidentals, annual meeting.....	175.00
Subscriptions to Abstracts:	
Editorial Office.....	6,800.00
Business Office.....	2,400.00
Subscriptions to Bulletin.....	1,500.00
Committee on Animal Experimentation.....	25.00
Apparatus exhibit.....	50.00
Inter-Society Color Council.....	25.00
Binding Yearbooks and Proceedings.....	10.00
Committee on Study of Teaching Psychology in Junior Colleges and Secondary Schools.....	150.00
Auditing accounts.....	400.00
Equipment.....	650.00
Miscellaneous.....	10.00
Total Estimated Expenditures.....	<u>\$16,200.00</u>

Estimated Income.....	\$17,140.00
Estimated Expenditures.....	16,200.00
Estimated Balance.....	<u>\$940.00</u>

## ABSTRACTS OF PAPERS

## GENERAL

Wednesday, September 7, 9:00 A.M.

100 Chemistry Building

C. L. HULL, Chairman

9:00 A.M. *The Law of Acquaintance.* R. H. WATERS, University of Arkansas.

In *Association Theory Today* Robinson suggested a new law of association called The Law of Acquaintance. This law was designed to cover the "possibility that the act of reading or reciting a given syllable may, irrespective of its associative connections, influence the facility with which that act enters into new associations." The paper to be presented describes a number of attempts to test this law experimentally. The general method employed required the subjects to read, write, or recite the items to be learned prior to the formal learning. The speed of learning under these conditions was compared with the speed of learning under control conditions in which the prior reading and reciting were omitted. The learning tasks, in the several experiments, covered paired associate learning and serial learning. The results from these learning experiments were essentially negative, *i.e.* they gave no support to such a Law of Acquaintance.

In a second type of approach to the problem the frequency with which the various consonants appeared in 10,000 words was obtained. This relative frequency of use was then compared with the frequency with which nonsense syllables, in which these consonants appeared, were anticipated. Likewise this frequency of use was compared with the association values of syllables in Glaze's and in Witmer's lists. In these comparisons it was found that frequency of anticipation and association value were positively related to the frequency with which the consonants appeared in the 10,000 words. If this frequency of use could be taken as an index of acquaintance in Robinson's sense then, in these last two comparisons, the Law of Acquaintance would be given experimental support.

Theoretical considerations, however, lead to the conclusion that the Law of Acquaintance is not an experimentally demonstrable law. [15 min., slides.]

9:20 A.M. *Retroactive Inhibition as a Function of Degree of Generalization.* ELEANOR J. GIBSON, Smith College.

The present experiment rests on the hypothesis that *generalization* may occur in various degrees among the stimulus items of verbal lists, and that *differential inhibition* is therefore required as a fundamental part of the learning. It is assumed, furthermore, that generalization may occur from list to list in varying degrees. The experiment is designed to test the deduction that difficulty in learning a second list will be proportional to the tendency for items of a first list to generalize with it (interference); and that retroactive inhibition will increase as degree of generalization between the interpolated and the primary lists increases.

A preliminary experiment yielded lists of stimulus forms graded according to tendency to generalize with "standard" forms. A primary learning list was constructed using the standard forms paired with nonsense syllables. Five conditions of interpolation were arranged: (1) the standard forms paired with new syllables; (2), (3) and (4) forms of three different grades of generalization paired with new syllables; (5) a control or "rest" condition. Learning was done by the method of right associates. The experiment was carried out first with groups, and later repeated with individual subjects.

Results showed a tendency for the interpolated list to be harder to learn as the degree of generalization between stimulus members of primary and interpolated lists increased. Retroactive inhibition likewise varied directly with the tendency for stimulus members of the interpolated list to generalize with stimulus members of the primary list. Errors of overt generalization (reversions to the previous list) occurred during both primary and interpolated learning, their frequency tending to increase with the degree of generalization. Errors of intra-list generalization occurred during the learning of both lists, but decreased considerably from primary to interpolated learning. [15 min., slides.]

9:40 A.M. *Geographical Orientation.* T. A. RYAN, Cornell University.

By the phrase 'geographical orientation' we refer to the orientation of the individual in a geographical world, a world which extends beyond the boundaries of the immediate perceptual field. Because it is a topic of interest in its own right and also because it bears upon problems of comprehending and thinking, we have undertaken a descriptive study of geographical orientation.

In our experiments (performed with the collaboration of Dr. Mary S. Ryan) trained observers were asked to describe their performances in solving an extended series of problems. The problems dealt with (1) the orientation of the observer's body with respect to objects outside of the visual field and with respect to compass directions, and (2) the orientation of cities and regions with respect to one another.

In solving many of these problems the perceptual world and the geographical world become integrated into a single unit. The perceptual field becomes *directionalized*. Put into words, the fact that 'that wav

is north,' or 'New York is over that way' becomes inherent in the field, and there is no necessity to 'reason out' the answer.

When the presented task involves giving directions from one geographical locality to another, and the observer's own orientation is not in question, visual imagining of two general sorts plays a primary rôle. The first and most obvious kind includes the map and the 'bird's eye view.' The second may be called 'telescoped imaginal traveling.' The orientation of the places comes out of an imaginal trip in abbreviated and condensed form. In this imagined event the thing which stands out is the general direction of travel. Thus the imagined scene may be directionalized in the same inherent way which we found in the perceptual field. [15 min.]

10:00 A.M. *Direction Orientation in Human Adults.* PAUL WOODRING, Recorder's Court, Detroit.

The problem was twofold: (1) To determine the nature and extent of individual differences in direction orientation. (2) To investigate the basis for such differences.

Pointing techniques were so modified as to make possible the measurement of accuracy of orientation in terms of degrees of error. Two hundred subjects were used, representing a wide range in age, intelligence, and environmental background. Each subject indicated the direction of both local and distant points.

Chief results: (1) The distribution was bimodal. Individuals tended to be either well oriented or completely unoriented with a few who were disoriented, i.e. "turned around." (2) The correlation with intelligence was very low. (3) Race, sex, and educational differences were not significant. (4) Some occupational differences were found. (5) Early environmental factors appear to determine the orientational habits which a child will develop. [10 min., slides.]

10:15 A.M. *The Effect of Patterns on Psychophysical Judgments.* L. D. GOODFELLOW, Northwestern University.

An individual confronted with the problem of choosing one of two responses will, when the criteria on which to base a judgment become difficult, follow a definite pattern or sequence in recording his judgment. Analysis shows that a possible explanation for the particular sequence used lies in the symmetry of the pattern.

The observer in an effort to make his responses follow an apparent haphazard order avoids a symmetrical pattern. (Symmetry suggests orderliness.) Since an experimenter (or instructor in making up a true-false test) does the same thing, the chances of the two patterns coinciding are thereby increased.

The results are based on data from three different types of situations, namely, psychophysical judgments in threshold measurement, responses on true-false tests, and audience responses to a radio test of telepathy. [10 min.]



10:30 A.M. *Perceptual Fluctuation as a Fatigue Index.* H. L. HOLLINGWORTH, Barnard College, Columbia University.

Previous studies of plane figures seen in reversible perspective have reported the rate of fluctuation to be influenced by various conditions, such as practice, drugs, and fatigue. Fatigue, in particular, has been reported to slow down the rate of fluctuation.

Using two such figures, with tests at half hour intervals during eight periods of continuous work, on several different days, and with two groups of six and four subjects respectively, comparison was made of rate of fluctuation with various fatigue indicators, such as output, subjective estimate, and time of day.

Rate of spontaneous fluctuation of the figures of reversible perspective was found to *increase* both with increasing practice and also with increasing fatigue as thus measured. Analysis of previous reports shows that such results were really present there also and the idea that fatigue slows up the rate of fluctuation, whether spontaneous or voluntary, must apparently be revised.

This being the case, the reported effects of practice and of various drugs also merit re-investigation and the differences between spontaneous and voluntary fluctuation invite further exploration. The phenomena of reversible perspective also deserve better interpretations than those in terms of stresses, field-forces, and other demonological conceptions. [15 min.]

10:50 A.M. *Techniques of Measuring Hue Discrimination of Lower Mammals.* WILLIAM E. WALTON, University of Nebraska.

Most of the experiments upon the lower mammals in the field of color discrimination are now discarded as the result of new research studies. The Munn, Muenzinger and Walton discussions mark the advent of a new period of experimentation. A technique has been developed in the Nebraska Laboratory which combines a new apparatus set-up, and a method of experimentation which have yielded unequivocal results.

The best features of Munn's projection device have been built into the Nebraska apparatus, Wratten filters, numbers 29F, 70, 74, 73 Delta and 75 Eta, and semi-automatic brightness controls are used in the new machine. A modified form of Lashley's jumping apparatus is placed in front of the colored patches. The procedure consists of: (1) establishing a brightness discrimination habit; (2) introducing a period of over-learning; (3) varying the brightnesses until a point of confusion or PSE (point of subjective equality) is reached; (4) training new animals at the PSE; and (5) running control tests on the brightness factor.

The use of this technique has yielded conclusive evidence of color discriminative ability of rodents to red-green, red-blue, red-yellow and blue-yellow on a basis of hue differences. Experimenters were unable to establish a blue-green and green-yellow discrimination when the brightnesses were equated. [15 min., slides.]

11:10 A.M. *Prediction of Vicarious Trial and Error by Means of the Schematic Sowbug.* EDWARD CHACE TOLMAN, University of California.

It has been found with rats that the amount of vicarious trial and error (VTE) is small early in the course of discrimination learning, increases during the middle of such learning, and decreases again toward the completion of such learning.

The "schematic sowbug" is a theoretical device which I would offer as a way of predicting such findings. It is conceived on the analogy of a Loebian tropistic animal but with certain "additions and improvements." Such additions and improvements would include: the assumption that stimuli of any given physical dimension, to which the organism is sensitive, can be represented as angularly arranged around the organism; the adoption of a distinction between orientation movements, progression movements and non-environmentally directed movements; the incorporation within the animal of excitation curves similar to those recently suggested by Spence; and, finally, the acceptance of a doctrine of tensions, valances and vectors similar to Lewin's. Such a schematic sowbug presents, I believe, a hopeful theoretical model or atom for predicting certain fundamental features of behavior. Or, to put this another way, this "sowbug" is a first attempt at specifying the characters of what I have elsewhere called the " $f_s$  function." [15 min., slides.]

11:30 A.M. *The Immunological Concept of Learning.* WALLACE MARSHALL, Appleton Clinic, Appleton, Wisconsin.

This paper presents the physiological implications of the learning processes from a new point of view. With the brain cells possessing a marked degree of sensitivity, the point is made that afferent stimuli, whether they are visual, acoustic, olfactory, etc., seem to sensitize the particular areas of the brain which have to do with the reception of the particular nerve tracts in question.

Added stimuli cause further sensitizations of these areas, and learning takes place through the immunological mechanisms of cellular response to irritation. The point is brought out that the synapses are rather a secondary consideration, for the caliber of stimulus (size), plus the number of stimulations, plus the nature of the recording centers in the brain (normal or pathological), determines such factors as the rapidity and aptitude of the learning processes.

From the normal phase of learning, it is understood readily how pathological syndromes arise, such as residual hypersensitized reactions to certain key words, as exemplified by what Freud terms "complexes."

This new concept of learning ties the normal with the abnormal manifestations, and explains the physiological nature of the amentias, word blindness, etc. It opens new avenues of attack on this subject and suggests new clinical and laboratory procedures in order to gather further data on such problems. [15 min.]

## CLINICAL PSYCHOLOGY

Program arranged in collaboration with the Program Committee of the  
American Association of Applied Psychologists

Wednesday, September 7, 9:00 A.M.

*Social Administration Auditorium*

E. A. DOLL, Chairman

9:00 A.M. *Some Techniques and Pitfalls of Psychological Tests of Criminals.* LOWELL S. SELLING, Recorder's Court, Detroit.

Current psychological tests do not seem to be adequate in themselves to give a proper evaluation of criminal attitudes and behavior. The personality scales have been tried in the Psychopathic Clinic of the Recorder's Court and have been found not to check with clinical diagnoses, and to be not particularly prognostic. The intelligence tests in themselves do not indicate criminal tendencies, inasmuch as the range of test scores corresponds to the normal range, even though the curve is somewhat skewed. To objectify attitudes, interests and emotional balance of convicts, particularly with reference to predicting their behavior and devising adequate treatment, new procedures have had to be adopted, modified and discarded, and current techniques have been revamped in order to produce results with the criminal. The criminal attitude of uncoöperativeness, failure to understand the possible favorable result to himself of the psychological examination, is the basic reason for the need for variations in the approach. Several procedures have been tried and found wanting. An attitude test to show unfavorable interest in police, consisting of a cross-out picture test of various types of faces, with the items concerning police weighted heavily, fails to produce results. Standardization of the autobiography has been in progress for several years, and certain features have been objectified. The Rorschach Test, with particular bearing on criminal attitude and personality, is being used, and significant preliminary results are herein reported. The Rorschach Test and history information are checked by polygraphic instruments. The results of these procedures as applied to a group of 300 offenders going through the Court Clinic are summarized. This study was made with the collaboration of Charles L. Vaughn. [15 min.]

9:20 A.M. *Preliminary for a Study of Disciplinary Problems in Prison.*  
L. M. HANKS, JR., University of Illinois.

One hundred convicts were chosen at random among those who had been ordered to solitary confinement for infraction of prison regulations. (a) This group was compared with the prison population at large: The disciplined group contained a significantly greater number of persons sentenced for crimes against property and a fewer number of persons sentenced for crimes against chastity, public policy and persons than would be expected from chance selection. Analysis of the types of crime against property revealed slightly more persons sentenced for burglary,

larceny and robbery and slightly fewer sentenced for forgery than would be expected by chance selection. Analysis of occupational differences revealed a greater number in the disciplined group that were engaged in manufacturing and fewer engaged in agriculture, mechanical trades and domestic service. (b) This group was further compared with a group paired on the basis of type of crime, length of time served in prison, length of prison sentence and the fact that no time had been served in solitary confinement: No significant differences were observed in intelligence, number of convictions of felony, previous environment, marital state or physical health. The disciplined group showed a smaller range of age and a larger range of significant answers on a psychoneurotic inventory. Further inquiry should follow the leads offered in regard to type of crime and occupation, possibly investigating attitudinal differences. [10 min.]

9:35 A.M. *A Test-Interview for Delinquent Children.* RALPH M. STOGDILL, Bureau of Juvenile Research, Columbus, Ohio.

The purpose of this report is to describe a test-interview devised by the writer for use with delinquent children and administered with the assistance of Miss Ruth Pushin to 100 delinquent boys and 50 public school boys, ages 11 to 17 years. The two groups were closely matched as to age, intelligence, and economic status. Any differences that exist are in favor of the control group.

The "Behavior Items" is a test-interview consisting (in the experimental form) of 180 items printed on 2 x 3 inch cards. The "Behavior Items" together with a set of Maller's "Personality Sketches" were given to the subjects individually with instructions to sort the cards into two boxes, a "yes" box and a "no" box.

Statistically reliable differences were obtained between the average test-interview scores of the delinquent and the control groups. When the responses of delinquent boys are correlated with case history data, it is found that practically all items referring to lying, stealing, truanancies, sex offenses, assaults and gang activities are reported with a high degree of reliability. Boys who have engaged in excessive auto-eroticism or in setting fires do not readily admit these acts.

The results indicate that delinquent children, when given an opportunity, will reveal types of misbehavior not mentioned in their case histories and which may not have been brought to light in comprehensive clinical interviews. [15 min.]

9:55 A.M. *Some Technological Aspects of Counseling Adult Women.* ROSE G. ANDERSON, Psychological Service Center of New York City.

Two of the measures used in an individual counseling project carried out for a women's organization were the Bernreuter Personality Inventory and the Allport Study of Values. The results from these two measures are analyzed and discussed with respect to their contributions and limitations in personal counseling. It was possible to consult confidential credentials for each woman counseled. These credentials included

detailed statements from university instructors, employers, co-workers and others over the entire training and work experience periods. These statements covered personal characteristics, vocational skills, efficiency, etc. A comparison is made of the individual's results on the above measures with the indications of the presence or absence of the traits measured in: (a) the theoretical expectations resulting from the individual's choice of and selection for the field work in which she was engaged; (b) in the statements in her credentials; and (c) in her own discussion of herself. The theoretical expectations as to personality traits would be a predominance of individuals who are above the average adult woman in emotional stability, self-sufficiency and social aggressiveness. The Bernreuter results show 70% of a group of forty women above the 60 percentile in all three traits. The question of emotional stability is raised in the papers of four of these. These cases and those falling below the 30 percentile are analyzed. The theoretical expectation as to interest drives is a predominance of high religious and social interest values. The Allport results place 81% and 69% of a group of twenty-six women above the 60 percentile in religious and social interest drives, respectively. Individual cases are analyzed including those showing significantly low religious and social interest values. [10 min.]

10:10 A.M. *A Statistical Evaluation of Specified Cues Related to the Moment of Stuttering.* WENDELL JOHNSON, State University of Iowa.

It is obvious that stuttering occurs intermittently. Does it also occur randomly, or in relation to specified cues? If it occurs in relation to specified cues, to what degree does it do so?

A series of studies pertinent to these questions will be reported. In each experiment adult stutterers read standard passages and stuttered words were marked. Cues were systematically introduced into the reading passages and into the situations, and changes in frequency and loci of moments of stuttering were noted and treated statistically.

To statistically significant degrees stuttering was found to occur in relation to such cues as pencil markings in the reading passages, color of paper from which the reading was done, mirrored reflection of the reader, photographs of "hard" and "easy" listeners, etc. Implications of the findings will be discussed. [10 min., slides.]

10:25 A.M. *Treatment of Enuresis by the Conditioned Reaction Technique.* JOHN J. B. MORGAN, Northwestern University.

While a large number of factors may contribute to enuresis in different individuals, case studies suggest that many depend upon poor teaching. Once the habit is established, the child may be shamed, frightened, tormented, or punished, and thus taught to resist normal attempts at reeducation.

When analyzed into its simplest form, the problem of training the enuretic child may be stated as follows: Teach the child to respond to bladder tension by arising from bed and going to the toilet. The old



methods usually involved the negative purpose of refraining from responding to bladder tensions.

Having stated the problem, the next essential was to effect the response in some manner. The enuretic sleeps through micturition instead of arising. Bladder tensions are inadequate stimuli for rising; a loud gong is adequate to awaken the child. If a gong could be made to ring immediately after the occurrence of bladder tension, the child should be able to learn to respond to the bladder tension without waiting for the gong to ring.

A pad was placed in the bed of the enuretic child which was wired in such a manner that a slight amount of moisture would complete a circuit and ring a bell. The child was told that the ringing of the bell was a signal for him to get up and go to the toilet.

This method has proved effective in approximately eighty per cent of the cases with whom it has been tried. The learning required, ordinarily, a very short time. When the plan did not succeed, it was usually because of the refusal of the child to coöperate. He would break the wires, push the pad to one side, or throw the switch so that the bell would not ring. [15 min.]

10:45 A.M. *A Mongolian with Superior Attainment in the Language Arts.* WILLIAM H. THOMPSON, Municipal University of Omaha.

Charles is a Mongolian. Chronological age 20 years. Mental age 9 years Form L Revised Binet. Special room instruction 12 years. Parents are American born. Mother is a Normal School graduate. Father held two college degrees. Mother was 39 at his birth. Mongolian tendencies were recognized by the attending physician at his birth.

Charles has the physical characteristics of a typical Mongolian. His intellectual performances range from the imbecile level to high school attainment in such a manner as to suggest the ancient description of idiot-savant.

Charles shows outstanding performances in the language arts. Reading tests indicate levels up to 15 years and six months on standardized tests. Knowledge of history, geography, arithmetic, and language usage is from the 12th to the 15th year levels. Vocabulary on the Revised Binet and on the New Stanford Achievement Test is at the 12 year level. His conversation about current events is equal to that of the average adult.

Charles has interests which include the reading of novels, history, biography, newspapers, and magazines. He converses on current events and points of national and international interest.

Charles shows certain disabilities. He is quite slow in his reactions. Ordinary manual activities are very inferior. His failures include memory for sentences, digits reversed, verbal absurdities, certain problem situations, opposite analogies, etc. He is socially inadequate, taking part in only a few group activities. He is not anti-social in his attitudes but shuns new group situations.

This case represents profound deviations as observed in the general picture of Mongolianism. [10 min., slides.]

11:00 A.M. *Illustrative Techniques for Differential Diagnosis and the Measurement of Individual Improvement.* FLORENCE MATEER, Psychological Service, Columbus, Ohio.

One of the most important needs in clinical psychology is an increased number of testing techniques which will yield adequate information concerning the patient's (1) quality of intelligence responses; (2) rate of thinking; (3) rate of fatigue; (4) ability to maintain a constant effort; (5) mediocrity or individuality of such responses. Many such evaluations can be made available and intelligible if one orders his own technique of examination so that certain constant procedures may be interpreted, not only from the end result of a final test rating, but also from the angle of analyses which will yield information upon these much more subtle points.

The use of the Kent-Rosanoff, a series of other free and controlled association tests, a speed measurement of learned associations, and some correlated analysis of simple motor activities have yielded full value for our clinical work with adults, both normal and pathological in problems, this past four years. Even such a clinically brief series gives diagnostic indications which cannot be obtained through ratings of level or success unaccompanied by similar attempts at analysis of functional quality.

There are evident and marked differences between normal individuals who are tired and those who are rested. Glandular cases show certain syndromes of test behavior not indicated in the final rating of test accomplishment.

The clinical use of such series need not wait for complete norms covering time and production, for most such work is individual. The clinician as well as the patient is far more concerned with the individual's ability at a given time and his progress or retrogression until the next interview than in his accomplishment index as compared with any great number of other people. Basic norms are, however, available for use and interpretation. [15 min.]

11:20 A.M. *The Experimental Use of Drugs in Psychopathology, Past and Future.* M. M. PARKER, Ohio State University.

For biochemists psychopathological disorders are aberrations in bodily chemistry; for experimental psychologists these aberrations are behavioral. This paper attempts to indicate advances of pharmacotherapeutics in psychopathology, and possible lines of critical experimental attack. Literature in this field occurs in medical journals, but practical and theoretical implications of this subject as behavioral bring it properly before the psychologist for consideration.

Clinical use of drugs in psychopathology requires a physiological and psychological approach. Therefore, experimentation in this field demands two controls. Few investigations include either one. Consequently results are equivocal on both counts. Recovery may be due to suggestion, specific physiological influence, both, or neither.

The author has formulated an experimental procedure designed to overcome this difficulty. It involves experimental restatement of the problem plus a change in method of analyzing results, directed toward attaining an objectively valid and reliable psychopathology. [10 min.]

## ANIMAL LEARNING

Wednesday, September 7, 9:00 A.M.

Chapel, University Hall

W. T. HERON, Chairman

9:00 A.M. *Learning Difficulty and Magnitude of Stimulus Variation.*

DAEL L. WOLFLE, University of Chicago.

Gulliksen and Wolfle have presented a rational theory describing learning and transfer of a visual discrimination by the white rat. From this theory it is deduced that rats require fewer trials to learn to select the brighter of each of two pairs of brightnesses if the two pairs are from adjacent portions of the brightness scale than if they are from remote portions.

To attain a criterion of 20 consecutive errorless trials, rats trained on two adjacent pairs, two somewhat different pairs, and two remote pairs, required, respectively, averages of 77.6, 96.8, and 122.6 trials. The increase in difficulty is statistically significant.

These results substantiate the deduction that learning difficulty increases with an increase in the distance separating the two brightness pairs. The difference in difficulty is theoretically due to the lesser amount of generalization over the greater distance. [10 min., slides.]

9:15 A.M. *The Effect of Frequency of Reinforcement upon the Level of Conditioning.* W. J. BROGDEN, Johns Hopkins School of Medicine.

Given twenty trials per day, twelve dogs, divided into three groups, were conditioned to bell in the following manner: With group A, flexion evoked by shock to the left forepaw was conditioned, shock being administered consistently. Once 100% flexion to bell was reached, four additional test-periods were given, the mean of these twenty scores (five from each animal) being the group norm. Group B received identical treatment, except that following conditioned flexion shock was omitted. With 100% shock-avoidance reached, each flexion to bell was rewarded with food. The norm for conditioned flexion reinforced by food was established identically to that of group A. Group C, with parotid salivary fistulae, was subjected to combinations of bell-food until a series of five periods of 100% consistent conditioned salivation was obtained, from which the norm was computed.

Each group was then appropriately reinforced eighty, sixty, forty, and twenty per cent of the time. Each frequency of reinforcement was maintained for five test-periods and occurred first, second, third, and fourth in one animal of each group. By this procedure, means based on twenty scores for four different frequencies of reinforcement are made available for comparison with the group norms and with each other, the effect of extinction having been neutralized.

The level of the conditioned responses reinforced with food tends to decrease as reinforcement-frequency decreases, but shows variability. Level of flexion reinforced by shock increases progressively from 100% to 40% reinforcement and then at 20% drops slightly. The response-level of each type at any frequency of reinforcement is above 80%. The results will be fully discussed in relation to present concepts of conditioning. [15 min., slides.]

9:35 A.M. *Alternation Behavior in Rats as a Function of the Time Interval Between Trials.* GLEN L. HEATHERS, Yale University.

This experiment tests two assumptions: (1) Rats tend despite reward to avoid repeating a maze reaction just performed. (2) This avoidance of repetition is stronger the shorter the interval since the performance of the reaction.

The animals were given twelve series of five trials each on a single-unit, elevated T-maze, with reward always present on both pathways. The intervals separating the trials of a series were 15, 30, 60, and 120 seconds.

*Results:* (1) At all intervals, reliably over 50% alternation (i.e. avoidance of the pathway last run) occurred. (2) Reliably more alternation occurred with a 15-second than with a 120-second interval.

The avoidance of repetition (alternation) is interpreted as the product of decremental factors, whose significance for the concept of inhibition is suggested. [10 min., slides.]

9:50 A.M. *An Experimental Investigation of the Relative Influence of Frequency and of Motivation in Animal Learning.* PAUL M. FITTS, JR., University of Tennessee.

The influence of degrees of reinforcement was compared with the influence of degrees of motivation in a study of the permanence of learning in the white rat. Animals were trained to manipulate a lever through a vertical maze, and were rewarded with food. One reinforcement was given each day. Persistence of non-rewarded behavior at the completion of training was taken to indicate the relative permanence of learning. The learning problem was completely automatic and animals were trained in a sound-shielded box under constant environmental conditions.

Thirty animals, in three groups, were given nine, fifteen, and twenty reinforcements respectively. These groups later made 16.1, 24.8 and 61.6 non-rewarded responses during one hour. Sigmas of these means were 5.5, 7.9, and 16.1.

Fifty animals were trained at one of the following conditions of deprivation: 24-hours with no reward, 0-hours reward, 6-hours reward, and 24-hours reward. These groups contained seven, six, eighteen and nineteen animals respectively. Of these 29%, 33%, 72%, and 89% learned the problem. They were all given twelve reinforcements. The 6-hour reward group made 18.2 non-rewarded responses during the first hour; the 24-hour reward group made 22.6 responses. Sigmas of the means were 3.3 and 4.1.

Results are interpreted as indicating that food-deprivation activates the animal and increases the probability of learning. In animals which do learn, however, the frequency of reward is more important than degree of motivation in establishing the permanence of behavior.

These investigations were made in the Laboratory of Psychology of the University of Rochester. Miss Doris Mount, of Mills College, trained most of the animals in the first study. [15 min., slides.]

10:10 A.M. *The Effect of Short-Wave Radiation on Maze Learning in the White Rat.* HUGHBERT C. HAMILTON, Temple University.

The effect of short-wave radiation, which increases temperature, on maze learning was studied with two groups of white rats. Each animal of one group was placed in the field of radiation for two minutes immediately prior to each trial in the maze for forty-five trials, one trial per day. The group was then given fifty-five more trials without radiation. This radiation produced average increases in body temperature, measured anally, ranging from 3.5 to 5.0 degrees Fahrenheit. The animals of the other group were given one hundred trials in precisely the same manner as the radiated group, except that they received no radiation. The maze used was a five-alley interchangeable unit U-maze, which gave high coefficients of reliability.

The radiated group made a smaller number of errors per trial than the non-radiated group, which difference was consistent through the first seventy-five trials, thus the effect persisted through thirty trials after radiation had been stopped.

Observations were also made on certain physiological differences which developed between the two groups.

The collecting of the data and much of the work of this experiment was done by Mr. Herman Molish and Mr. Glenn Ulanski. [15 min., slides.]

10:30 A.M. *Selection in Maze Learning.* JOHN F. SHEPARD, University of Michigan.

With trained rats, dead-end blind mazes are learned with little evidence of order of organization. Mazes consisting of series of semi-open fields show obvious backward organization. Patterns of circle blinds and long-short pathways occupy intermediate positions. These facts suggest two factors of selection: first, short-circuiting of the erroneous by eliciting an anticipatory recoil reaction, operating without reference to order; second, a positive approach reaction governed through an association pattern leading to the goal, typically organized backwards. When forced by swinging walls into a fixed blind and then along true-path, the animal shows anticipatory recoil strikingly; but when seven different terminals of the blind are used in rotation, no such behavior appears. Such a variable blind without forced entrance proves difficult. A maze constructed with such blinds, making the first factor impossible, was learned very slowly and definitely backwards. Contrariwise, a maze with fixed blinds and variable true-path exit from junctions, thus crippling the



second factor, is learned more easily and without order. Recoil from the circle blind is dependent on repeated floor cues. In a maze in which all blinds return to the beginning, recoil arises from repeated cues (probably floor) at the beginning.

Statistical treatment has not been completed; but it is evident that there is no positive correlation between learning in any of these types and either learning the unit-alike enclosed maze or reasoning performance in the enclosed maze, while the reasoning seems dependent upon the floor cue as measured by the unit-alike maze.

That both factors of selection merely express at once organization of response with reference to a fixed goal and canalization of learning likewise, is indicated by results of exploration of complex mazes with no ulterior goal. [15 min., slides.]

10:50 A.M. "*Hypotheses*" in Rats: A Critique. H. A. WITKIN, New York University.

The problem here is to ascertain whether Krechevsky's results with insoluble situations are duplicated in situations involving learning, and whether the systematic responses ("hypotheses") he describes are actually attempts at problem solution. The set-up employed in all our experiments duplicated Krechevsky's in all essentials.

In one experiment a separate group of rats was run on three *learning* situations of increasing difficulty to obtain pre-solution periods of varying length. Not even in the most difficult situation were any systematized responses obtained during solution. Thus, in true learning situations the animal does not systematize its choices but orients specifically at each junction.

As found by Krechevsky, though, when specific choice-point orientation is made *impossible* through changing blinds, the animal does repeat its choices systematically. Eliminating blinds entirely (making differential choice-point orientation *unnecessary*) should again result in such systematized behavior. Experiments with such free-choice situations showed this to be the case. That is, "hypotheses" were evidenced in situations without blinds (without a problem). Thus, when an animal must make many responses (32) in rapid succession in structurally identical units, and in units where specific choice-point orientation is impossible or unnecessary given choices are repeated. This accounts for "hypotheses" behavior.

What determines the shift from one "system" to another? To answer this three free-choice situations, differing in the complexity of the stimulus situation introduced at each choice-point, were employed. The results show that increasing the complexity of the stimulus situation causes an increase in the number of systematized habits and a decrease in their duration. Running each group upon a corresponding insoluble situation gave essentially the same results. Thus, the shift from one habit to another depends upon the complexity of the choice-point stimulus situation.

It is concluded that the "hypotheses" concept as applied to rats is untenable. [15 min.]

11:10 A.M. *The Problem of Organization in Ant Learning.* T. C. SCHNEIRLA, Washington Square College, New York University.

In this study, the individual records of 30 ants in their learning of a standard maze problem were subjected to a detailed analysis. During the learning of this situation by *Formica incerta* workers there are certain characteristic behavior changes which signify the development of organization in the maze response.

Initial improvement involves the elimination of general errors, those not attributable to specific features of the alley pattern itself. Thereupon, passage through the maze is fairly regular, interruptions mainly occur at alley corners or endings, and blind alleys favored by centrifugal swing are established parts of the route. The mutual independence of choice-point responses at this stage is shown by the fact that an experimentally forced deviation from the regular course typically results only in local difficulties.

There follows a series of trips marked by a plateau in the learning curve (sometimes by an upward trend), related to the process of blind-alley elimination. The change is featured by the appearance of a new and distinctive set of responses to the alleys which immediately precede each difficult choice-point. Progress in the organization of choice-point responses is indicated by the fact that the irregular alternation of the original and the new reaction complexes at a given junction on successive trips is accompanied by apparently related shifts in the subject's response to the following choice-point. The significance of these events is disclosed particularly by occurrences in the case of subjects which did not master the problem. Certain of the failures apparently were inferior learners, others were working under special and difficult experimental conditions.

An explanation will be offered for the fact that this "intermediate plateau" phenomenon characterizes the appearance of a learned organization among the units in the ant's total maze response. [15 min., slides.]

11:30 A.M. *Thresholds of Brightness Relations and Discrimination Learning by Chicks.* JAMES R. PATRICK, Ohio University.

Using a modification of the Yerkes-Lashley Discrimination Apparatus in which chicks were not allowed to correct errors, some fifty chicks were trained to discriminate brightness relationships between stimulus pairs of Hering's greys. (Graded series from 1 to 30.) Some chicks were trained first to the pair numbered 1 and 30 (with some chicks the darker grey was positive; with others the lighter), until they learned to discriminate 80% or better. Immediately following the establishment of this habit they were presented with and trained to other pairs as 3-28, 5-26, etc., until their thresholds for brightness relationship were reached. Other chicks were trained first to pairs near their thresholds as 11-20, and if mastery occurred they were presented with and trained to pairs upward in the series to 1-30. Still others were trained to different combinations of pairs including Köhler's phenomenon. The results indicate in the first and second instances, that while chicks react to this shift from one pair to another, they show definite transfer effects to subsequent pairs. This

effect holds whether the subsequent pairs are in the direction of relatively constant increasing or decreasing gradations of brightness relations. In the latter case the threshold is reached. Generally, it is the relation of 'darker-than' or 'lighter-than' to which the chicks responded. In the last instance the relationship phenomenon was further confirmed. The use of greys as stimulus patterns makes possible the determination of the degree of similarity for transfer effects. Other factors, degree of difficulty, time in relation to correct and incorrect responses, and emotional factors as thresholds were approached, are examined. The relation of these phenomena to 'equivalence of stimuli,' to 'stimulus-response,' and to theory will be indicated. [15 min.]

#### MENTAL MEASUREMENT

Wednesday, September 7, 1:30 P.M.

100 Chemistry Building

L. L. THURSTONE, Chairman

1:30 P.M. *Proportional Sampling Methods and Some Results of the General College Adolescence Study.* JOHN G. DARLEY, University of Minnesota.

A cross-section study of 76 characteristics found in 1,300 freshmen and sophomores was made by Hollerith methods in 1935-1936. The number comprised almost the entire college population of the specified year. Plans for a more intensive study necessitated the selection of small, but completely representative, samples of 50 men and 50 women in urban areas. Hollerith cards were first sorted by sex and urban residence. Within each sex the cards were successively sorted as follows: (1) Three categories of parents' nativity: both native-born; either foreign-born; both foreign-born. (2) Within each parent-nativity groups, three classes of student's own ability: college entrance test in upper one-third; middle one-third; lower one-third. (3) Within each student-ability group, six classes of father's occupation, scaled on the Minnesota Institute of Child Welfare Occupational Scale.

These successive sortings gave 54 groups of cards for each sex. The number in each group was converted to a percentage of the total number of each sex, and these percentages were applied to the desired N of 50 to determine proportional sampling. In identifying individual student names, closeness to the group's average age and completeness of test data were used as two additional sampling factors. Eta coefficients between fathers' occupations in the sampling and fathers' modal occupations derived from interview work histories are .91.

In the course of extensive field work for this study, mothers, fathers and students each filled in: the Minnesota Scale for the Survey of Opinions; the Minnesota Inventories of Social Attitudes; three Thurstone Attitude Scales; and a modification of Chapin's Sociality Index. Mother-father, mother-student, and father-student correlations for men and

women students on the resultant thirteen measures are presented and discussed herewith. [15 min.]

1:50 P.M. *Criteria for the Selection of Pictures for the Investigation of Adolescent Phantasies.* PERCIVAL M. SYMONDS, Teachers College, Columbia University.

One thousand one hundred sixty-eight stories were written on 81 pictures by pupils in junior and senior high schools. The pictures were rated by 9 judges on seven point scales for the following qualities: absence of detail, appeal to the adolescent, emotional qualities, incomplete situation, family situation, probable situation, and also for general value.

The stories were rated by 3 judges for variety, extent to which material in story goes beyond the details and situation shown in the picture, and also for general value.

Correlations were computed between all the ratings. The ratings of the stories serve as criteria against which to test the characteristics of the pictures which yield the most productive phantasies. The correlations are used as a basis for setting up criteria for the selection of pictures which may be used for the investigation of adolescent phantasies. [10 min., slides.]

2:05 P.M. *Halo: Its Prevalence and Nature in Estimates of Objective Traits and in Inferential Trait-Judgments.* W. V. BINGHAM, Stevens Institute of Technology.

The tendency for trait judgments to reflect in part the observer's general impression of the person has commonly been regarded only as a troublesome source of error. But halo springs not only from remediable conditions such as the inexperience or carelessness of observers; it inheres also in the perceptual process itself and in the very act of judgment.

This paper presents an analysis of judgments made under constraints which called for appraisal of traits, not in the abstract, but as indications of personal suitability in specified situations. It appears that in evaluating directly observable characteristics like "voice" and "appearance," halo is as prevalent as in judgments of more complicated and obscure traits like "ability to plan and organize," which require the appraiser to draw judicious inferences from behavior elicited during interview.

It should be recognized that a trait-judgment is the estimate of a configuration in which the trait is but an aspect of a personality pattern. This aspect varies, not independently, but with the ground.

The person may remain constant while the observer's attention shifts from his "voice" to his "appearance," "manner," "alertness," "freedom from bias," or "emotional stability." Each trait is and should be rated as a characteristic of that person.

When instructions require judgments to be passed on traits as evidences of personal suitability, each trait is projected against a still broader ground which includes the total personality pictured in relation to the duties or situations specified. In judgments of this sort. halo is not only

a natural phenomenon; it is at once inevitable and desirable. [15 min., slides.]

2:25 P.M. *The Relative Efficiency of Fine and Coarse Weighting of Questionnaire Items.* GEORGE K. BENNETT, Psychological Corporation.

Widely used personality and interest questionnaires utilize a large range of positive and negative weights for responses to items. These weights reflect rather closely small differences in discriminative efficiency, but increase the time and cost of scoring either by hand or the new I.B.M. scoring machine.

New scoring scales using small positive weights have been constructed for two scales of Bernreuter's Personality Inventory and one scale of the Strong Vocational Interest Blanks. The correlations of these abbreviated scales with the original scales approach unity. Scoring time is diminished more than fifty per cent. The method of assigning the diminished weights for these and other scales is discussed. [10 min., slides.]

2:40 P.M. *The Stability of Test Score Profiles.* CHARLES R. LANGMUIR, Carnegie Foundation for the Advancement of Teaching.

The use of test score profiles of individuals has been urged especially in connection with cumulative records of students' progress in secondary school and college. Some understanding of the stability of the measurements, the degree of permanence of the individual profile pattern and level of achievement is essential to the interpretation of such complex observations. With the use of measuring instruments of known reliability the chance variation of an individual profile can be calculated. Such a measure is defined and some data concerning its magnitude are presented.

In addition to a knowledge of the chance variation or total unreliability of a profile, it is of interest to know the extent of change of individual test profiles after a lapse of considerable time. In 1928 the seniors in a number of Pennsylvania colleges were examined with a 12-hour test battery. Nine years later 130 of these students were reexamined with the identical test battery.

Data presented reveal that for the group as a whole the effect of forgetting is small in comparison with the wide range of achievement found in the group as a whole when seniors. Correlations between the 1928 and 1937 scores suggest the degree of confidence we may place in the stability of individual patterns independent of mean gains and losses. Slides of illustrative cases are shown. [15 min., slides.]

3:00 P.M. *Age Differences in Mental Ability as Measured by a Work-Limit Test.* HERMAN A. COPELAND, International Business Machines Corporation.

Age differences in mental ability studied with time-limit tests have shown a decline in mental ability after the middle twenties. The tests used have measured speed along with power of mental reactions. It is gradually recognized that speed of reactions decreases with advancing



age, but no studies have been made showing the relationship between speed and power and increasing age.

To a sample of 7,500 adults of ages 15 to 75 years a work-limit mental ability test was given and a record was kept of the time required to complete each test. Curves have been drawn to show the decline in power and speed. Power declines slower with the work-limit test than with a time-limit test. Speed was found to decline in a linear fashion. [10 min., slides.]

3:15 A.M. *Vocational Interest Patterns of Professional Women.*  
MARGARET SEDER, University of Minnesota.

The assumption that the vocational interests of professional women differ from the interests of men in the same profession, one made by all who have constructed Vocational Interest Tests for women, was tested experimentally. One hundred women physicians and one hundred life insurance saleswomen filled out the Strong Vocational Interest Blank and the Strong Vocational Interest Blank for women. Possible sources of differences in scores between professions of the same name scored on both blanks were as follows: (1) Lack of consistency of response to identical items on the two blanks. (2) Differences in weightings for any profession given identical items on the two blanks. (3) Preponderance of heavily weighted items among those occurring on only one blank.

Results include an item analysis of the blanks with consideration of individual consistency, an item analysis of scoring keys and a factor analysis of scores from the two blanks. Finally, correlations between scores for professions represented in the scoring keys for both blanks are considered with reference to the hypothesis that interests of men and women engaged in the same profession are the same and that correlations are of the magnitude to be expected of alternate form reliability. [15 min.]

3:35 P.M. *A New Self-Scoring Answer Card.* NOEL B. CUFF, Eastern Kentucky State Teachers College.

This report presents a recent development which overcomes certain defects in available marking and scoring devices.

A self-scoring answer card is demonstrated, which indicates (without counting of individual answers and without using a scoring machine) the total test score. In addition, the method can be used to obtain either the total number of right answers, the total number of wrong answers, separate totals for sub-tests or for types of "diagnostic errors," or a weighted total using interchangeably weights of 1, 2, 3, and -1, -2, -3. The card yields also for item-analysis the number of right answers for each question in a set of papers.

Data show the speed and accuracy with which the new device will disclose scores and item-analyses for tests and for either learning, ESP, or other experiments. [10 min.]

## ABNORMAL PSYCHOLOGY

Wednesday, September 7, 1:30 P.M.

Social Administration Auditorium

C. LANDIS, Chairman

1:30 P.M. *A Controlled Study of the Developmental and Personality Characteristics of Chronic Alcoholics.* PHYLLIS WITTMAN, Elgin State Hospital, Elgin, Illinois.

A scale following J. O. Chassell's lead in his "Experience Variables" has been devised to include all the points considered by various writers to be characteristic of the personality and developmental etiology of the chronic alcoholic. This complete scale consists of fifteen large divisions, including Mother Relationship, Father Relationship, Home Life, Social Adjustment, etc.

Each one of the parts, I through XV, has from 2 to 20 factors listed under it and each of these traits are in turn divided into four graduated descriptive levels. In scoring the data a numerical value is assigned to each of the four levels and in this way the exact place on a scale continuum is determined for each group on each trait. Consequently, the difference between the alcoholic and control groups indicates which of the 100 traits that make up the scale significantly differentiate the chronic alcoholic.

The experimental subjects were 100 patients from Elgin State Hospital and Cook County Psychopathic diagnosed chronic alcoholism without psychosis and 100 controls equated as to age, education and nationality.

The results give a composite picture of the developmental traits and personality characteristics of the chronic alcoholic. Among these are a domineering mother who insisted on things being done her way, a stern, autocratic father whom the patient feared somewhat as a child, and a feeling of insecurity, as evidenced by an insistent feeling of need for religious security and a strong feeling of sin and guilt, etc.

Summary of results, conclusions from the data, general conclusions and plans for further study are included in the paper. [15 min.]

1:50 P.M. *The Mental Efficiency of the Narcotic Drug Addict.*

GRAHAM B. DIMMICK, University of Kentucky, in coöperation with J. E. Partington and the U. S. Public Health Service Hospital.

Conflicting opinions regarding the mental efficiency of the narcotic drug addict and the effects of the habit in producing changes in psychological functioning suggest the need of more objective characterizations than those afforded by clinical descriptions.

This study reports an application of the Babcock Mental Deterioration Test to 156 incarcerated male drug addicts ranging in age from 18 to 68 years. Duration of addiction ranged from two months to twenty-five years. These subjects had been withdrawn from the use of the drug six months prior to this study.

Comparisons of the mental efficiency of this group are made with two control groups of like age and ability in terms of efficiency indices, learning, motor and repetition scores. Comparisons within the experimental

group are similarly made in respect to the variables of age, ability, and duration of addiction.

The data indicate: (1) A differential effect of age upon the functions measured by three of the sub-groups of tests; (2) statistically reliable differences adverse to the experimental group in all comparisons with the normal groups; (3) no reliable differences in mental efficiency related to the duration of addiction when the variables of age and mental ability are held constant.

The data of this study suggest the hypothesis that the functional characteristics of the drug addict revealed by these tests existed prior to drug addiction and that they may have contributed directly or indirectly to the formation of the drug habit. [15 min.]

2:10 P.M. *The Production of "Experimental Neurosis" in the White Rat.* STUART W. COOK, University of Minnesota.

As a consequence of continued contact with a stressful situation, three of a group of six white rats developed disorders of behavior. Although these disorders formed a different pattern in each animal, all have been considered manifestations of an "experimental neurosis," this expression having been defined to mean "any chronic, abnormal behavior experimentally produced."

The experimental situation and its stressful elements were as follows: The rats were strapped to a stand so that the only sizeable limb movement possible was a flexion of the right foreleg. Under certain conditions such a flexion was rewarded with a food pellet; under other conditions it was punished with an electric shock. Observation indicated that the animals experienced two principal stresses: the first, when they were required to delay the food-bringing flexion until they received a bright-light stimulus; the second, when they were required to make a very difficult discrimination between a bright-light stimulus which permitted a food-bringing flexion and a dim-light stimulus which prohibited such a flexion on pain of shock.

Because, under such conditions, the organism was receiving, simultaneously, stimuli to the excitation and inhibition of the same response, the stresses experienced have been characterized as comprising a "clash" between the neural activity of initiating a response and the neural activity of inhibiting the same response.

A comparison of this successful experiment with three previous experiments led to the belief that, to produce enduring disturbances, it is necessary to limit activity as much as possible to the critical response. This carries the implication that extraneous activity in some way negates the neural effects produced in the stressful situation. [15 min., slides.]

2:30 P.M. *The Autonomogram in the Study of Psychotic States.* CHESTER W. DARROW, Institute for Juvenile Research, and ALFRED P. SOLOMON, University of Illinois College of Medicine.

The autonomic responses of psychotic patients to various stimuli have been plotted in "autonomograms" with blood pressure changes along the

ordinate and palmar galvanic responses along the abscissa. It has been shown that before treatment with insulin or metrazol patients manifesting various forms of overt hostility or antagonism and those manifesting "resistance" toward discussion of their personal problems with the psychiatrist tend to fall toward the upper left corner of the autonomogram with large blood pressure reactions and small galvanic responses. After recovery following treatment with insulin or metrazol these patients' reactions shift toward the right of the autonomogram, galvanic reactions being increased and blood pressure responses in some cases being reduced.

For comparison two groups of psychotic patients are selected on whom we have no data on pharmacologic treatment. One of these groups is selected because the individuals manifest a hostility, antagonism, or resistance similar to that observed in one of the groups of patients before recovery. The other group was selected because of coöperative attitudes and partial or complete remission of psychotic symptoms without pharmacologic treatment. Comparison of the autonomograms of these two groups of untreated patients shows the same type of difference in reaction to stimulation though to somewhat less degree than that observed before and after shock therapy in the pharmacologically treated patients.

Evidence that the reactions of the resistant autogonistic patients involve inhibition of parasympathetic activity and that the reactions of the improved patients involve activity of the sympathetic and possibly also of the parasympathetic system will be considered. [15 min.]

2:50 P.M. *The Response of Schizophrenic and Normal Subjects to Stimulation of the Autonomic Nervous System.* F. H. RODNICK, Worcester State Hospital.

As a method of studying the responsiveness of the autonomic nervous system of the schizophrenic to stimulation, a group of 20 schizophrenic patients and 20 normal controls were employed in an experiment involving the heat regulating mechanism. Heat loss from the lungs through conduction and evaporation was gradually blocked by having the subjects breathe oxygen which had been raised to body temperature and saturated with water vapor, so that presumably the vital loss of heat was perforce shifted entirely to the cutaneous mechanism. It was found that this type of stress was effective in evoking a marked autonomic response.

During the control period the subjects breathed oxygen having a temperature of 30 degrees centigrade and a relative humidity of 20%. By means of a valve arrangement the oxygen was then shunted through a chamber in which it was heated to slightly above body temperature and sufficient water vapor added to achieve saturation. Continuous records of systolic and diastolic blood pressure, heart-rate, galvanic skin response and respiration were obtained.

Although the basal levels of the various indicators during the control period were fairly comparable for both the normal controls and the patients, the former group gave significantly larger autonomic responses to the increase in temperature and humidity of the inspired air. The findings lend experimental support to indications that the schizophrenic



is markedly deficient in autonomic reactivity. Dr. H. Freeman collaborated in the experiment. [15 min., slides.]

3:10 P.M. *Schizophrenic and Normal Profiles of Response to an Auditory Apperceptive Test.* DAVID SHAKOW, Worcester State Hospital.

From one of the discs for B. F. Skinner's verbal summator, twenty successive vowel patterns, which might be regarded as auditory analogues of the Rorschach visual stimuli, were presented for apperceptive response to 25 schizophrenic and 20 normal control subjects. The experiment was repeated on the patients after approximately a year.

A scoring system which formally considers the responses according to complexity of structure, meaningfulness, ego-reference, use of foreign language, closeness to stimulus pattern, etc., was developed and employed in the analysis of the results. Different profiles of response appear for the normal, hebephrenic, and paranoid groups. The normal profile includes a relatively greater proportion of responses which have sentence structure, which follow the stimulus pattern closely, are meaningful and have ego-reference. The hebephrenic reactions, although consisting largely of meaningful responses in sentence structure, are relatively remote from the stimulus pattern and are frequently couched in a foreign language. The paranoid profile gives prominence to syllables and exhibits a tendency towards a later assignment of meaning to the originally non-meaningful responses.

The content of the responses in relation to certain symptoms of the psychosis and the consistency of reaction after the lapse of a year are considered. The procedure is evaluated in comparison with the Rorschach test and the contribution of the present method towards an understanding of schizophrenia is discussed. The study was made in collaboration with Saul Rosenzweig. [15 min., slides.]

3:30 P.M. *Picture Completion in Schizophrenia and in Organic Disorders.* EUGENIA HANFMANN, Michael Reese Hospital, Chicago.

Occasional observations made on schizophrenic patients suggested that their appreciation of pictorial representation differed greatly from the normal one. To investigate this difference the Healy Pictorial Completion Test II was given to 62 schizophrenics, 17 patients with organic brain lesions, and 70 normal controls, and the completions thus obtained were analyzed. The so-called absurd placements proved especially informative. They were absent in the normal group, but occurred in two-thirds of the schizophrenics and in three-fourths of the organic patients. The common characteristic of these placements is the disregard of the spatial relationships essential for the realistic pictorial representation. By giving up this spatial frame of reference, the patient is able to make meaningful connections of non-realistic nature. Objects may be inserted in the pictures as being merely wished for or thought about by the person in the picture. They may also be placed there because they belong to the same concrete sphere as the situation depicted, or because



they represent this situation in a symbolic way, giving the key-note, as it were. Occasionally the persons and events represented seem to be given the status of reality and acquire personal reference. While completions of all these types occur both in the organic and in the schizophrenic group, the response of the organic patients is generally on a lower level and less differentiated than that of schizophrenics; for the latter the occurrence of peculiar solutions together with normal and even good ones is characteristic. An attempt is made to trace the peculiarities in the appreciation of pictures to a more general defect of thinking common to organic and schizophrenic patients. [15 min.]

3:50 P.M. *The Influence of Chance in Extra Sensory Perception Research.* CLARENCE LEUBA, Antioch College.

That at least some of the supposedly significant deviations from chance expectations in experiments with the E.S.P. cards are due to the *selection* of lucky subjects, out of a large number tested, was shown experimentally by following the test procedures commonly used with E.S.P. cards, except that, by matching two packs of cards with one another, the results were made to depend on chance alone. The hits for the first 10 runs were credited to an imaginary first subject; those for the second 10 runs to an imaginary second subject; and so on. If a "subject" scored above the chance expectation for his first 10 runs, he was given a second session; if again successful, a third session; and so on. In this manner, 87 "subjects" made a total of 67,050 matchings (2,682 runs), averaging 5.03 hits per run; this is insignificantly different from the theoretically expected average of 5.00. But 7 of our "subjects" averaged between 6 and 8 hits per run for from 200 to 1,000 trials; these "subjects" showed, supposedly anti-chance, critical ratios of above 2.5. The difference between the average number of hits of certain "good subjects" and certain "poor subjects" was likewise supposedly indicative of something else than chance. Our results are an experimental verification, in this particular field, of the general mathematical principle that anti-chance values are meaningless unless calculated with reference to *all* the data of *all* the subjects in *all* the investigations. [15 min.]

## INDUSTRIAL PSYCHOLOGY

Program arranged in collaboration with the Program Committee of the American Association of Applied Psychologists

Wednesday September 7, 1:30 P.M.

Chapel, University Hall

M. S. VITELES, Chairman

1:30 P.M. *A Method of Measuring the Effect of Advertising Influences on People's Behavior.* ALBERT D. FREIBERG, Psychological Corporation.

In the measurement of advertising influences by recognition, recall and other psychological techniques it was discovered that there was no available measure of people's buying behavior which might serve as a yardstick for evaluating the effects of these advertising influences on buying behavior. Since the primary purpose of most advertising is to influence people to buy one particular brand or type of product, the Brand Barometer studies were designed to measure changes in people's purchase by brand and type of products.

These Brand Barometer studies are conducted on a nation-wide basis with the coöperation of associated psychologists. The information is gathered by personal interview, using a questionnaire.

Jenkins has reported a study showing high reliability for the method and a second study showing high validity of the method. The results of this bi-monthly series of studies over a four year period (totaling over 200,000 interviews) have been found to be valid measures of trends in people's buying behavior when compared to sales records in fields where accurate information of this kind is available.

This experimental and practical proof of reliability and validity of this technique justify its use as a method for measuring trends in people's buying behavior, particularly in the many fields where actual sales trends are not available, or where sales trends, because of their dependence on general economic factors, are not true indices of the effects of advertising influences.

Specific case histories of trends in buying behavior in various fields have been prepared, and the effect of advertising influences on people's behavior has been measured. [15 min., slides.]

1:50 P.M. *Additional Variables in Trade-Name Confusion.* JOHN G. JENKINS, University of Maryland.

A review of previous American investigations shows that the most common technique employed to check confusion between trade-names has been a modification of the recognition method. A list of trade-names has been presented and then the subjects have been required to identify these originals in a longer list containing some of the originals, some alleged infringements, and some new names.

Consideration reveals that there are involved in this method certain basic postulates which have been assumed but never proved. This report is concerned with the experimental investigation of the truth of two of these: (1) The assumption that a test of confusion without appreciable

lapse of time between presentation and identification is adequate because the percentage of confusion would change at an approximately constant rate for all trade-names. (2) The assumption that a test of confusion with a single presentation of the original is adequate because there would be only a relative change if multiple presentation were used.

In order to test these postulates, the writer has used both visual and auditory presentation. Trade-names taken from the literature have been presented singly and multiply to similar groups of subjects; and recognition tests have been made after varying lapses of time. The results indicate that neither of the above postulates is justified. The outcome has practical significance for all future tests of confusion in connection with court procedures. [15 min., slides.]

2:10 P.M. *Some Effects of Music on Workers in a Radio-Tube Manufacturing Plant.* JOHN F. HUMES, Pennsylvania State College.

The experiment purports to determine effects of phonographic music upon workers engaged in routine occupations. The experiment was divided into 5 periods: (1) a five-week check period, the selections chosen at random as had been the practice previous to this study. Music was played 10 minutes every hour of an eight-hour day; (2) a three-week period, music chiefly in slow *tempo*: (a) one week, music 5 minutes every half hour; (b) one week, 10 minutes every hour; (c) one week, 15 minutes hourly; (3) three weeks, no music; (4) three weeks, chiefly fast *tempo* selections, intervals as above; (5) three weeks "arranged" programs, intervals as above. No significant differences in production are observed. Spoilage slightly greater and worker-protest frequent when cacophonous *swing* "music" is played. Arranged "popular" programs, 15 minutes hourly are preferred. [10 min.]

2:25 P.M. *A Study of Public Opinion among a Group of Industrial Workers.* DOUGLAS MCGREGOR, Massachusetts Institute of Technology.

This study represents an attempt to get at the nature and genesis of the opinions of a group of industrial workers toward layoff policy. The subjects were employed by one company, and were members of a C.I.O. union. The data were gathered in an anonymous questionnaire, and supplemented by observational study of the operation of the policy in the plant. The workers were questioned regarding the type of layoff policy they would prefer, their attitudes toward the administration of the existing policy, their desires in connection with "sharing the work," etc. Information was obtained concerning such things as the length of service and the financial need of the worker.

Although certain definite trends are apparent, there is a complete lack of crystallized public opinion within this group. The data reflect the ambiguity of the circumstances surrounding layoffs; inconsistencies between the printed and the practiced policy of the company, a vague union policy, the absence of organized conflict between employees and employer. Under such circumstances preëxisting individual attitudes may easily influence judgments, and considerable disagreement is likely to appear within the group.

The data clearly indicate that there may sometimes be no public opinion worthy of the name among a group of "rank and file" union members, even though the issue is of considerable importance. Questions may be raised concerning the nature of the circumstances under which a crystallized public opinion will appear. The data further question the frequent assumption that conflict is reduced by the existence of a clearly stated policy which is meticulously followed in practice. It seems likely that an ambiguous policy may sometimes prevent opposition toward the company, and that it may also prevent friction within the union. [15 min., slides.]

2:45 P.M. *Study of One Hundred Cases of Automobile Drivers Arrested for Accidents or Traffic Violations.* AGNES ARMINDA SHARP, Municipal Court of Chicago.

This is a psychologic and psychiatric study made in the Psychiatric Institute of the Municipal Court of Chicago of 100 selected automobile drivers arrested for causing accidents or violating serious traffic regulations during the last year in Chicago. The facts gathered by the usual clinic methods will be considered against a background of other research in automobile safety problems and of studies made of fleet bus and truck drivers.

The purpose of this study is the standardization of an adequate routine examination and interview method and form to be used in the study of traffic offenders and persons causing automobile accidents. To this end the paper will evaluate a large number of facts including intelligence ratings, personality inventories, scores from road tests, and such personal history items as education, family background, and medical history. Socio-economic factors as work records, income, adjustment to community life, and attitudes toward social and legal controls will be discussed. Court dispositions in the cases will be reported. [15 min.]

3:05 P.M. *Drivers 20 to 40 Rate Highest on Tests.* EARL ALLGAIER, American Automobile Association.

This study was made to determine how certain abilities of drivers varied with age. During the past two years 30,000 drivers in 25 states were examined by a battery of tests given to the general public.

The program was carried on to inform drivers of any weaknesses they might have and to accumulate research data concerning drivers. The following is an analysis of the test records of 7,000 men drivers 15 to 70 years of age.

Generally speaking the best scores were made by drivers 20 to 40 years of age. Strength reached a maximum of 115 pounds at age 24. Average systolic blood pressure increased to 132 mm. at age 20, 136 mm. at 40 and 160 mm. at 70. One hundred per cent visual acuity (Snellen) was attained only by drivers 20 to 30 years of age. The widest field of vision was 192 degrees for drivers 15 to 40. Drivers 20 to 25 withstood the most glare. Resistance was halved at age 60. Best distance judgment scores (error of 36.4 cm.) were made by men 20 to 30. Highest activity test scores of 220 to 223 taps in 30 seconds were made by those aged 20 to 30. Complex reaction time increased from 0.565 seconds at

age 30 to 0.660 at age 60. Hearing loss increased slightly after age 40. Color vision improved slightly after age 40. The dominance of one eye over the other increased slightly after age 50. On the drivometer test the best observation scores were made by drivers age 25 to 35, the best scores in steering by drivers 25 years of age and the time required for the test was least from age 15 to 25 years.

Curves showing these variations have been drawn for men 15 to 70 years of age. [15 min., slides.]

3:25 P.M. *Driver Judgments in Passing on the Highway.* T. W. FORBES and T. M. MATSON, Yale University.

A study has been made of the judgments and choices of drivers on the highway when they are overtaking and passing other cars. This research on the human factor has been undertaken in connection with the study of the requirements for overtaking and passing necessitated by the physical factors represented in the vehicle and the highway.

A technique was evolved by which accurate time and distance measurements were made under actual conditions of overtaking and passing on the roadway. It was thus possible to measure the driving behavior of the ordinary run of drivers and on various types of roadway. The free distance ahead demanded by the driver was obtained as well as the distance which he actually required in passing a vehicle.

Approximately 700 observations have been obtained at various speeds and in four major geographical locations; i.e. New England, Midwest, the West Coast, and the High Plateau Region of the Western Mountainous Area.

Results will be presented in terms of distance demand and judgment made by the driver and its correspondence to his actual performance needs. Differences were found between the individual drivers in a given locality. A comparison of drivers' performance in the four geographical areas will be presented together with a discussion of factors which are probably involved. [15 min., slides.]

3:45 P.M. *The Relationship of Validity Coefficients to the Practical Effectiveness of Tests in the Employment Situation.* HAROLD C. TAYLOR and JAMES T. RUSSELL, Western Electric Company, Inc.

It is recognized that the predictive power of a test is not linearly related to the validity coefficient, and that the efficiency of the test is better represented by  $E=1-\sqrt{1-r^2}$  than by  $r$ .

However, it is not well recognized that in the employment situation, where not all persons who are tested must be employed, neither  $r$  nor  $E$  provides an adequate picture of the effectiveness of a test. When test (selected-rejected) and criterion (satisfactory-unsatisfactory) variables are dichotomized in certain proportions, the curve resulting from plotting effectiveness against correlation is negatively accelerated, rather than positively, as is the efficiency curve in the regression sense.

These relationships have important implications with regard to the usefulness of tests with low validity coefficients. Charts and tables are presented and the implications are discussed. [10 min.]



ANNUAL BUSINESS MEETING  
THE PSYCHOMETRIC SOCIETY

J. P. GUILFORD, *President*

WEDNESDAY, SEPTEMBER 7, 4:00 P.M.

100 DERBY HALL

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FIRST SESSION

THE NATIONAL INSTITUTE OF PSYCHOLOGY, INC.

SAMUEL W. FERNBERGER, *President*

WEDNESDAY, SEPTEMBER 7, 4:00 P.M.

102 DERBY HALL

## PROGRAM: RESEARCH AND INSTRUCTIONAL FILMS

Wednesday, September 7, 8:00 P.M.

Chapel, University Hall

JOHN E. ANDERSON, Chairman

Note: The showing of films will not be accompanied by verbal descriptions, since proper titles in the films will be adequate.

*The Experimental Psychology of Vision (condensed version).* G. M. GILBERT, Columbia University. [15 min.]

*The Measurement of Intelligence.* G. L. FREEMAN, Northwestern University. [12 min.]

*An Animated Cartoon of the Schematic Sowbug.* EDWARD CHACE TOLMAN and CLARK W. CRANNELL, University of California. [4 min.]

*A Quantitative Study of Development in Erect Locomotion.* MYRTLE B. MCGRAW, Columbia University. [15 min.]

*The Development of Spontaneous Coöperation in Rats in a Competitive Eating Situation.* O. H. MOWRER, Yale University. [10 min.]

*Technique for the Study of Food Preferences in the Rat.* PAUL THOMAS YOUNG, University of Illinois. [3 min.]

*A Motion-Picture Study of the Acquisition of the Token-Reward Habit in the Cat.* KARL U. SMITH, University of Rochester. [15 min.]

*Imitation and the Effect of Dominance Status on Learning in Chimpanzees.* JAMES H. ELDER, Yale University School of Medicine. [17 min.]

*Photographic Studies of Gibbons and Orang Outans.* C. R. CARPENTER, Columbia University. [15 min.]

*"Experimental Neurosis" in the White Rat.* STUART W. COOK, University of Minnesota. [10 min.]

*Objective Methods for the Analysis of Human Brain Cases.* WARD C. HALSTEAD, University of Chicago. [10 min.]

*Shock Therapy in Dementia Praecox.* L. F. BECK, University of Oregon. [15 min.]

*The Differentiation of Aphasia from Mental Deficiency in Children.* ANTHONY J. MITRANO, The Training School at Vineland, New Jersey. [8 min.]

*Democratic and Autocratic Group Atmospheres.* RALPH K. WHITE, Iowa Child Welfare Research Station. [10 min.]

## PSYCHOMETRICS

Program Arranged by the Program Committee of the  
Psychometric Society

Thursday, September 8, 9:00 A.M.

Chapel, University Hall

J. P. GUILFORD, Chairman

9:00 A.M. *A Rational Comparison of Item-Selection Techniques.*  
DOROTHY C. ADKINS, University of Chicago.

In several published studies, various item-selection techniques have been compared empirically. The conclusions are somewhat contradictory, since the results of each study are dependent not only on the general characteristics of the methods compared but also on the particular characteristics of the data at hand. A rational approach to the same problem has the advantage that it is not subject to accidental peculiarities of a given set of data. This discussion is limited to techniques which do not involve inter-item relationships and which imply or permit dichotomous scoring. It is demonstrated mathematically that, with certain assumptions, some twenty-five or thirty existing techniques fall into three main groups: (1) those which are approximations to the item-criterion correlation coefficient; (2) those which are exactly or approximately equivalent to the slope of the regression line of item on criterion; (3) those which are exactly or approximately equivalent to the slope of the regression line of criterion on item.

On the basis of the foregoing analysis, it is predicted that item indices within any one of these three groups will be highly correlated. Further, it is deduced that, of the three groups, the second is most favorable to items of fifty per cent difficulty and the third least favorable to such items. Empirical evidence is presented in support of these and other rational deductions applicable to specific techniques within each group. Finally, from the formula for the correlation coefficient of a composite of variables with a criterion, it is argued that, if inter-item relationships are disregarded, the selection index should be a measure of correlation (Group 1) rather than a measure exactly or approximately equivalent to either of the regression coefficients (Groups 2 and 3). [15 min.]

9:20 A.M. *A Statistical Approach to Typology.* JOSEPH ZUBIN, Mental Hospital Survey Committee, New York City.

The purpose of this paper is to present the technique and results of an attempt to subdivide a population of individuals into subgroups of like-minded or like-structured individuals with reference to several variables—that is, into “types.” The technique consists of four steps: (a) Division of each variable into two or three or more steps in accordance with certain critical values of the scale; (b) regarding the scores that fall into each step as equivalent, determine the total number of variables in which

every individual is identical with each of his colleagues; (c) on the basis of these agreement scores, divide the population into tentative subgroups; (d) determine for each subgroup the specific pattern that characterizes all of the individuals in the subgroup.

The method has been applied to psychoneurotic inventory data collected on 68 acute schizophrenics and 68 matched controls. Characteristic patterns have been discovered in the responses of each of these groups and it is possible from a knowledge of the total response patterns to indicate the probability for a single individual of belonging to the normal group or the schizophrenic group. This method suggests that the substitution of an index of the total response pattern in place of the total score may yield more significant measures of personality adjustment.

The method is also applicable to other fields where a total index of the status of an individual on a series of variables is desired. Certain mechanical devices have recently been invented for facilitating the labor involved.

This method differs from others in at least three respects. It does not involve the assumptions underlying correlational techniques and factor analysis; nor *à priori* assumptions regarding distribution of variables, it provides the research worker with tentative groupings of like-minded individuals for further investigation. [15 min., slides.]

9:40 A.M. *Rater's Minimal Discrimination as a Criterion for Determining the Optimal Refinement for a Rating Scale.* HORACE CHAMPNEY and HELEN MARSHALL, Antioch College.

Rating scales are notoriously so unreliable that it is frequently held that a nine-point scale is a refinement unwarranted by the power of discrimination of the rater. The authors, finding the rating scale to be the only practicable technique for evaluating parent behavior (as observed on home visits) as part of the child's home environment, set out to see how much precision could be attained under better than average rating conditions.

Graphic scales were set up for about 30 characteristics of parental behavior, and ratings secured on about 80 different homes. The scores were obtained with various degrees of refinement, ranging in equivalence from a three-point to a ninety-point scale.

A number of types of "reliability" and "validity" coefficients were computed, including ratings with reratings, parallel ratings, and ratings with a three-rater criterion. The curve for these correlations, plotted against the refinement of scoring, was found to rise sharply and gradually level off. The refinement of the scale found at the leveling-off point is interpreted as the degree of refinement justified by the rater's power of discrimination for that scale.

Results seem to justify the construction of rating scales, where rating conditions are optimal, providing anywhere from thirteen to twenty-three degrees of discrimination. A criterion is suggested for evaluating different raters and different scales in terms of the fineness of the discriminations yielded. [15 min., slides.]

10:00 A.M. *The Equivalence of the General Factors Found for Successive Levels on the New Stanford Revision.* QUINN McNEMAR, Stanford University.

The purpose of a recently completed study was (1) to determine whether the items of the New Binet are saturated with a common factor to the exclusion of any conspicuous group factors and (2) to supply information which might suggest whether the central factor at one age level is the same as at other levels. This paper is concerned with the second of these objectives. By the use of fourteen different experimental age groups fourteen separate analyses of from 19 to 35 variables (items) were so arranged as to include all the items of the two forms in at least one analysis and at the same time provide a series of overlapping analyses. For example, experimental age 2 includes the items at year levels II and II-6, while the analysis on experimental age 2½ includes the items at levels II-6 and III, and thus the items at level II-6 overlap or are common to these two analyses. A similar, though sometimes modified, scheme was followed at other age levels. The first factor loadings for items which overlap two adjacent analyses behave in such a manner as to constitute presumptive evidence to the effect that the general or central factors at the several age levels are homologous. The implications of this finding will be indicated. [15 min., slides.]

10:20 A.M. *A New Theory of Transfer Applied to Experiments in Visual Discrimination.* HAROLD GULLIKSON, University of Chicago.

A generalized theory of discrimination learning has been extended to cover certain problems of transfer. The derivation starts with assumptions parallel to those used in a theory of learning developed previously.

Transfer to any configuration  $i$  resulting from training on two other configurations  $a$  and  $b$ , is represented by the equation

$$T = \frac{\sqrt{F(w)} - Bw - b}{\sqrt{F(w)} - Aw - a}$$

where  $T$  represents the amount and direction of transfer at any given time during training,  $w$  represents the number of correct responses,  $F(w)$  is a quadratic, and the coefficients are functions of the animals' learning ability and the similarity of the test to the training configurations, as determined by discrimination experiments.

It is shown that four deductions follow from this equation: (1) If the animal has been trained to go to the larger (or smaller) of two stimuli regardless of whether this stimulus is on the right or the left side, it will respond on a relational basis in transfer tests. (2) If the animal has been trained to go to one side for the configuration containing large stimuli and to the other side for the configuration containing small stimuli, it will respond on the basis of total size of stimuli in the transfer tests. (3) Accuracy of transfer to any given configuration will increase with increase in training. (4) The accuracy of transfer will gradually increase as the similarity of test to training configurations increases. These deductions are supported by experimental evidence.



This theory has also been generalized to predict transfer on an absolute basis with a more complex training situation. [15 min.]

10:40 A.M. *Mental Factors of No Importance.* TRUMAN L. KELLEY, Harvard University.

In the abundance of mental factors which have been reported by analysts of test data are to be found many which at present at least we do not know how to utilize in connection with guidance and education even if indubitably established, as well as many of small magnitude. It would be hasty to say that these are of no importance. Furthermore an examination of factors reported, grouped according to the nature of the population studied, reveals factors whose importance is somewhat called into question by the fact that they seem limited to some restricted type of population. Factors found with young children seem in part unrelated to those found with older; interest factors found with adults are at variance with those found with a younger age; and personality factors found with psychotics seem at best to be but anamorphous pictures of factors of normal subjects.

The neat statistical analyses which have been developed are quite inadequate to resolve the difficulties mentioned. The addition of issues complicates analysis, but there seems to be no other way out if the psychology of mental factors is to attain the place in the psychology of individual differences that many of us believe it merits.

One of the fundamental dimensions of life omitted from most attempts at analysis of ability is age. Another is sex. A third well nigh universally omitted is social, economic and geographic background. Does the most ardent believer in the fixity of factors believe that adequate analyses of Russian Communists, of German Nazis, of Iowa Republicans, would reveal the same dimensions of mental life? As one who does not believe they would the speaker is concerned with the logical issues to be met and settled in any psychologically sound program for the determination and later use of analytical mental measures. [15 min.]

11:00 A.M. *Maximum Prediction with a Minimum Number of Variables.* ROBERT J. WHERRY, University of North Carolina.

In view of the failure of the multiple correlation to increase markedly with an increase in the number of independent variables, the increased chance of actually decreasing predictive power of the scale due to shrinkage together with the increased cost of administering long batteries in practice make this question one of major importance. Two methods of achieving maximum prediction with a minimum number of variables are presented.

The first method, based upon a modification of the usual Doolittle procedure, gives an exact solution to the problem. Use is made of two previous discoveries of the author: an extension of the Doolittle procedure and a formula for the shrinkage of multiple R.

The second method gives excellent approximations but yields composite rather than multiple correlations. It is based upon a modification of the Kelley-Salisbury iteration technique.

Both methods obviate the necessity of calculating intercorrelations until after the selection of a test for inclusion in the battery. The exact method has been tried out by Dr. H. A. Edgerton in the Occupational Research Division of the Department of Labor and by Dr. H. M. Johnson of the National Research Council. [15 min.]

11:20 A.M. *Acquiescence as a Factor in the Measurement of Personality.* THEO F. LENTZ, Washington University.

For purposes of this paper, acquiescence is the tendency to agree rather than disagree to propositions in general.

The purpose of this study is to evaluate the potency of this factor in distorting measures. Two lines of attack are reported. The first is that of the double form, that is, presentation of all items both positively and negatively and the correlation between the double form and the single form noted below. The second approach is the intercorrelation between halves of a single form on such a trait as conservatism-radicalism when the test is divided to put the acquiescent factor antithetically in the two halves or equally in the two halves. Here the measure of potency is in terms of the differences in intra-correlations when the different splittings are used.

The general conclusion is that acquiescence may be a very distorting factor in the measurement of various other continua which call for positive and negative reactions to propositions listed.

A partial solution of this distortion is found in balancing the number of positive and negative items within a given test. There is some question, however, as to whether this does not spuriously force a zero correlation between acquiescence and the trait measured when there is a natural and inherent correlation present. No solution to this problem has been found, except the use of the double form presentation method, which may be all right for certain rare experimental purposes but is cumbersome for general use. [15 min.]

11:40 A.M. *Multidimensional Psychophysics.* M. W. RICHARDSON, University of Chicago.

The traditional psychophysical methods are limited to one dimension or linear continuum. In those situations in which the basis for psychophysical judgments is a complex of variables instead of a single variable, it has been necessary to be content with an inferior one-dimensional approximation. The present study is concerned with the extension of psychophysical methods to more than one dimension.

The theory and method for extending the scaling of psychophysical judgments to  $n$  dimensions are presented. Experimental application is made to the case of two dimensions. Judgments of similarity of nine (Munsell) colored cards arranged in triadic combinations provide scale-distances between all pairs of stimuli. A theorem concerning the rank of a certain matrix is adapted as a criterion for determining the number of factors involved in the similarity judgments. The result is the representation, as points in a space approximating to two dimensions, of the

colors used. Furthermore, a quantitative measure of the relative contributions to similarity of saturation and brightness is obtained.

Suggestions are briefly made for applications of the method to the exact construction of the color pyramid and to certain problems in social psychology. [15 min.]

### PSYCHOLOGY OF SOCIAL INSTITUTIONS

Program Arranged by the Program Committee of the  
Society for the Psychological Study of Social Issues

Thursday, September 8, 9:00 A.M.

*Social Administration Auditorium*

R. S. WOODWORTH, Chairman

Ten minutes allowed for discussion of each paper.

9:00 A.M. *Authoritarianism vs. "Self-Government" in the Management of Children's Aggressive (Anti-Social) Reactions as Preparation for Citizenship in a Democracy.* O. H. MOWRER, Yale University.

Based upon a comparison of the behavior of a (gradually changing) group of 20 to 25 preadolescent "problem" children (aged 3 to 12 years) at the New Haven Children's Center (i) during a year of more or less arbitrary adult management of disciplinary problems and (ii) during a year of "guided" self-government, this study shows that children make considerably more rapid adjustmental progress under the latter conditions. Self-government is favored by the children themselves; various incidental observations show it fulfills important childhood needs usually systematically frustrated. Some disapproval of self-government for children has been expressed, the underlying assumption—which will be challenged—apparently being that the traditional form of autocratic (parental) discipline constitutes a better preparation for adult citizenship in a democracy than does democratic training. The thesis will be maintained that the psychological appeal and force of fascism (and other authoritarian forms of political organization) have roots in the traditional autocratic practices of child-training and discipline. [10 min.]

9:20 A.M. *Emotional Stereotypes in the Chicago Tribune.—A Study of Newspaper Propaganda Arousing Standardized Emotional Reactions in Readers.* S. S. SARGENT, Central Y.M.C.A. College, Chicago.

Twenty terms frequently used in the news columns of the *Chicago Tribune* referring to the activities of the New Deal and organized labor (e.g. 'dictatorship,' 'agitator,' 'radical,' 'czarism') were assembled. Next, a contrasting list used in connection with Republican policies and non-strikers (e.g. 'private initiative,' 'freedom,' 'Constitution defender,'

'loyal workers') was prepared. These forty terms plus ten others were read to various groups: a large PTA meeting, a high school alumni fraternity, several classes of college students, a workers' forum, and a middle-class community forum. As each term was read the subject recorded his immediate emotional reaction by circling L(Like), D(Dislike), or ?(Uncertain). Rank order  $r$ 's between some groups exceeded .80, indicating similar responses. The workers' forum was atypical; its members registered *Like* for 'radical,' 'collectivist economy,' 'assault on business,' and *Dislike* for 'conservative,' 'business man,' 'private enterprise,' and 'Tribune.' Members of the middle class suburban PTA group averaged only 7 ? responses for the list, revealing a pronounced tendency to react emotionally; advanced college students gave close to 20 ? or non-emotional responses. Reactions of those checking *Like* for 'Tribune' were compared with the reactions of those checking *Dislike*. The former group showed somewhat less tolerance for 'agitators' and 'radicals,' more favor toward 'business,' and the 'Constitution,' and more pronounced emotional reactions generally. [10 min.]

9:40 A.M. *Racial and Regional Differences in Standard Therapy Rates among Seven Clinical Categories of White and Negro Mental Patients in Georgia and the United States.* J. E. GREENE, University of Georgia, and W. S. PHILLIPS, Division of General Extension, University System of Georgia.

Seven clinical categories of mental patients were compared, by each sex separately, for racial and geographical differences on the basis of these standard therapy rates: (1) "recovery" rate; (2) "improvement" rate; (3) "unimprovement" rate. Each refers to the specific therapeutic classification at time of discharge. All statistical analyses are based on records of the Georgia State Hospital (1923-32) and the other State hospitals of the United States (1923). The amount and reliability of differences in each of three standard therapy rates were computed for each of the following comparisons: (1) Georgia whites vs. Georgia Negroes; (2) whites vs. Negroes; (3) whites vs. Georgia whites; (4) Negroes vs. Georgia Negroes. The four major series of inter-racial and inter-area comparisons are analyzed in terms of a so-called "favorable" status of one race or geographic area as compared with that of another race or area. Marked and statistically reliable differences of considerable psychological and social significance occur between whites and Negroes in all three standard therapy rates. [10 min.]

10:00 A.M. *Psychological Aspects of the Johnstown Strike.* KEITH SWARD, *People's Press*, New Kensington, Pa.

The Johnstown, Pennsylvania, steel strike of June, 1937, represents a major conflict between the Committee for Industrial Organization and one section of the American Iron and Steel Institute. This paper is based upon field studies and documentary sources, gives the background of the conflict, and estimates its social significance. The immediate cause of the strike was the refusal of the Bethlehem Steel Corporation to bargain collectively with the Steel Workers Organizing Committee of the CIO.

Behind this lay years of paternalism, sub-standard wages, "company town" abuses, espionage, and abortive bargaining through a "company" union. The Citizens' Committee was patterned after the "Mohawk Valley" formula recommended to American industry for union-prevention by the National Association of Manufacturers. It sponsored a back-to-work movement. Most of its funds were supplied by Bethlehem Steel officials. The organization conducted a national publicity campaign for "law and order," circulated back-to-work petitions, demoralized the strikers, and provided Mayor Daniel J. Shields with strike funds. Plant officials admit paying \$36,000 in cash to the Mayor, who destroyed all records. Pickets were intimidated. Civil liberties were suspended. Most authentic instances of "violence" were the work of provocateurs. The Johnstown plant was stocked with \$25,000 worth of private tear gas in May-June, 1937. Labor spies cost the corporation \$16,000 in 1936. Similar widespread vigilante activities and attitudes indicate embryonic fascism. [10 min.]

10:20 A.M. *Intra-Individual and Extra-Individual Factors Influencing the Levels of Vocational Aspiration and Achievement.* WALTER A. LURIE, Jewish Vocational Service and Employment Center, Chicago.

The relative importance of intra-individual and extra-individual factors in vocational adjustment is the subject of this inquiry. Barr ratings of answers to the question, "What have you often thought that you would like to do for a living," have been found to represent a satisfactory estimate of the level of vocational aspiration. These scores for 375 subjects were further broken down according to occupational classification, previous employment record, subsequent employment history, scores on various tests, and other personal data. On the theoretical base of the Social Science Research Council Sub-Committee Report on Coöperative-Competitive Habits, an attempt was made to define discrepancy, knowledge, attitude, and skill in terms of the available data, and to formulate a statement of their interrelationships as they affect vocational adjustment. A preponderant influence of extra-individual factors in the determination of vocational adjustment is suggested by the data. [10 min.]

10:40 A.M. *Analysis of Public Opinion on the Prevention of War.* ROSS STAGNER, University of Akron.

According to a recent Akron survey, 92% of a random sample of people think there will be another World War. Over half think the United States will be involved. Since this opinion seems general, a study of possible modes of prevention seems important. Approximately 300 adults answered questions which, among other things, asked for their opinions on how to prevent war. The most frequent answer (69%) was "taking the profits out of war"; 34% endorsed "diplomatic agreements"; 32% "complete preparedness"; and 32% "united action of workers, farmers, and consumers." When persons endorsing these opinions are compared on a short militarist attitude scale, it is seen that preparedness goes with militarism, diplomatic agreements somewhat less so; profit



legislation is associated with a mild pacifist tendency, and "united action" with a more definitely anti-militarist attitude. Considerable inconsistency appears in the results. Of a random sample of the group, 16% endorsed both "military preparedness" and "united action," certainly different in intent; the tetrachoric correlation of these two opinions was .35. Some of the persons who said that wars are caused by munitions makers also endorsed preparedness as a preventive. Group-memberships determining opinion, *e.g.* American Legion, labor unions, etc., and comparison with a selected group of social scientists as to degree of "correctness" aid the interpretation. An attempt is made to show what slogans and stereotypes might be expected to be effective in an organized campaign against war. [10 min.]

11:00 A.M. *Attitudes of Different Economic Groups.* ARTHUR W. KORNHAUSER, University of Chicago.

Unsupported and conflicting opinions are widely expressed concerning the existence or non-existence of "class" feelings in the United States. Occupational groups and persons at different income levels were measured and compared with respect to their opinions on certain broad social-political issues. Data were obtained from several thousand men and women in a representative sample of the different sections of a metropolitan population (Chicago) by means of a personally administered, formal question-blank. On all the questions, though with significant variations, the greatest disagreement in attitude is that between the wealthiest and poorest income groups and between major business executives and labor union officials. Individual opinions within twenty economic groupings are related to facts of personal history, and to certain features of personal motivation and satisfaction as these are reflected in simple questionnaire responses. The personal history facts included sex, age, schooling, race, foreign birth, religion, unemployment, change in income level, presidential vote, and newspapers read. A number of meaningful differences occur with respect to these factors. Persons who express dissatisfaction with their work and status differ markedly on the average from those better satisfied, particularly at the higher income levels and in those instances where the particular point of dissatisfaction is clearly related to the social issue in question. Certain of the personal desire ratings are also significantly associated. [10 min.]

## PHYSIOLOGICAL PSYCHOLOGY, I

Thursday, September 8, 9:00 A.M.

100 Chemistry Building

K. M. DALLENBACH, Chairman

- 9:00 A.M. *Effect of Relative Strengths of Conflicting Responses on Mode of Resolution of Motor Conflicts.* ROBERT R. SEARS, Institute of Human Relations, Yale University.

It follows from the "gradient of excitation" interpretation of motor conflicts that the more nearly equal two conflicting responses are in strength, the greater will be the difficulty in resolving the conflict. This hypothesis has been verified by experiments on both manual and verbal conflicts. The assumption is made that the greater the number of pre-conflict practice trials, the greater is the strength of the response. With the manual conflicts the proportion of *blockages* increased as the number of practice trials on each of the two conflicting responses approached equality. With verbal conflicts the *reaction time* for the conflict trial increased under the same conditions. Certain important implications for therapy follow from the verification of this principle. [10 min., slides.]

- 9:15 A.M. *Determinants of Compromise Resolutions of Motor Conflicts.* CARL IVER HOVLAND, Institute of Human Relations, Yale University.

The factors influencing the frequency with which compromise resolutions are made in Type III (avoidance-avoidance) conflicts were studied with a manual motor conflict apparatus. Compromise resolutions were relatively infrequent when the conflicts were between two simultaneously instigated incompatible avoidance reactions to light stimuli. The frequency of compromise resolutions in the same conflict situation was much increased, however, by practice on a third reaction to a buzzer stimulus. The effectiveness of practice on the third reaction in producing compromise resolutions was found to be determined by the extent to which the direction of the third reaction approximated that of the two reactions in conflict. The effect was maximal when the third reaction was at right angles to the direction of movement of the two conflicting responses.

The implications of these results for Lewin's field theory and our stimulus-response formulation will be discussed. [10 min., slides.]

- 9:30 A.M. *The Order of Certain Psycho-physiological Events Following Intravenous Injections of Morphine.* RALPH R. BROWN, United States Public Health Service Hospital, Lexington, Kentucky, and University of Kentucky.

By means of a modified continuous injection technique, morphine sulphate was administered intravenously in gradually increasing amounts to five volunteer males, three being former morphine addicts and two being non-addict post-graduate students in psychology. Continuous records of respiratory and pulse rates were secured during the administra-

tion and subjects were requested to report all sensations and changes in feeling tone. Injections of physiological saline were used as controls. Results were analyzed and discussed with reference to the physiological and experiential changes occurring with gradual increases in dosage, with special emphasis upon time of physiological changes with reference to reported experiential effects. The results indicated the significance of the continuous intravenous injection method as a means of separating the experiential from the physiological effects of morphine and as a means of determining effective dosages. Physiological changes were produced prior to reports of drug effect, the respiration showing the typical decrease, whereas the pulse increased in rate. The two non-addict subjects did not differ from the three former addicts with respect to directional changes in pulse and respiratory rates following morphine administration. The non-addicts reported the effects as disagreeable; whereas the former addicts reported pleasant effects. The following conclusions appear to be justified: with gradual intravenous administration of morphine, increase in pulse rate and depression of the respiratory rate may be produced prior to verbal reports of drug effect; the order of experiential effect following morphine administration does not support Verworn's general theory of narcosis; the continuous intravenous injection method offers a means of more adequately controlling the amount of drug and rate of admission into the blood stream, eliminating the difficulties involved in the control of sensory cues, and eliminating the variables associated with individual differences in rates of absorption. [15 min., slides.]

9:50 A.M. *Psychological Changes During Treatment of Clinical Cases by Administration of Synthetic Male Hormone.* NEAL E. MILLER, Institute of Human Relations, Yale University.

Cases of adult castration, hypogonadism, senile prostatic hypertrophy and apparently psychic impotence were studied psychologically while being treated by male hormone substance, testosterone propionate. The substance was administered subcutaneously from three times weekly to once daily in doses of 20 mg. dissolved in 1 c.c. of peanut oil. As a control, of which the patients were not informed, injections of oil without hormone were given for periods before and during treatment.

During administration of hormone, definite increases were observed in the erectile capacity and sensitivity of the penis, in the strength of conscious sex urge and in the capacity to respond with the proper emotions to intercourse. Most of the patients changed from a previous state of mental depression to definite elation. A few manifested anxiety in such a way as to suggest that this was the result of a conflict between an intensified sex urge and inhibitions which are characteristic of our culture.

In general, the cases whose demonstrable hormonal abnormalities had been greater, manifested much more striking changes during treatment. The castrates, in particular, tended to exhibit more rational aggressiveness and less irrational irritability. Marked decreases were noted in their nervousness and emotional instability. Abnormal physical and mental fatigability disappeared. Muscle tonus, energy and stamina returned.

All patients, except one psychic case, regressed markedly during periods of control injection.

It is pointed out that, because patients could observe their own spontaneous erections, some of the effects manifested may have been secondary psychic elaborations on the more direct hormonal ones.

Access to patients was secured through collaboration in a more general project with James B. Hamilton, Ph.D., Department of Anatomy, Yale University, Gilbert Hubert, M.D., Albany Hospital, and Judson Gilbert, M.D., Schenectady. [15 min., slides.]

10:10 A.M. *The Effect of Male-Hormone on Behavior with Special Reference to Adolescence.* RICHARD T. SOLLENBERGER, Institute of Human Relations, Yale University.

A hypothesis is advanced that certain of the major aspects of adolescent behavior are in part the result of an increase in the sex drive and partly the result of the frustration of this drive by society.

It has recently been demonstrated that at pubescence there is a marked increase in the amount of male-hormone in boys. The following studies have been directed toward determining some of the behavioral changes that might accompany this increase in hormone output and whether the hormone is the specific instigator of the sex drive.

It was found that in a group of thirty boys that there was a definite relationship between the amount of hormone present in their urine and their maturity of interests and attitudes as shown by standardized test procedures. Ten boys within this group were intimately observed over a period of six months. It was observed that there was a high degree of relationship between their hormone content and certain social reactions.

As a control experiment on the above observations, castrated guinea pigs were injected with synthetic male-hormone (testosterone propionate) in order to determine if the hormone is the specific instigator of sexual behavior. It was found that there was a reliable difference between the sexual behavior of the injected group and the non-injected control group. [15 min., slides.]

10:30 A.M. *The Effect of Androgenic Hormone on Activity in Male and Female Guinea Pigs.* JOHN P. SEWARD, Connecticut College, and GEORGE N. PAPANICOLAOU, Cornell University Medical College.

Androgenic hormone has been found to induce muscular hypertrophy in gonadectomized male and female guinea pigs. The present study was undertaken to see if this effect was associated with increased activity. Two immature males and two mature females were gonadectomized. Activity was recorded in suspended cages wired to electric counters, adapted from the method of Schlosberg and Hunt. After a preliminary series one animal of each pair was injected with hormone over a period of six weeks while the other was injected with a control dose of oil; then the treatment was reversed for a similar period, and so on. Early data show no clear-cut difference between experimental and control records. This suggests that the hormone acts directly on muscle tissue and not

through general nervous stimulation. (Aided by the National Research Council Committee on Sex Problems.) [10 min., slides.]

10:45 A.M. *The Survival of Animals With and Without Adrenal Medulla in Conditions of Stress.* ROBERT E. HARRIS, University of Minnesota, and DWIGHT J. INGLE, Mayo Foundation.

Most experimental evidence supporting the "emergency" hypothesis of the function of the adrenal medulla is derived from studies using physiological preparations. This research was designed to test the hypothesis with reasonably intact animals.

The medullae of 100 rats were destroyed by enucleation and autogenous transplant, an equal number held as controls. A quantitative measure of behavior in an "emergency situation" was the time taken to swim to a point of exhaustion just short of death by drowning.

The results of three separate experiments show statistically insignificant but consistent mean differences in favor of the animals without medulla. If these data do not show an actual superiority of the operated animals, they at least do not support the hypothesis that the adrenal medulla is a necessary or even valuable adjunct to behavior in a condition of stress. [10 min., slides.]

11:00 A.M. *Patterns in Emotional Reactions: II. Heart Rate and Blood Pressure.* HAROLD V. GASKILL, Iowa State College.

In a study involving the objective measurement of emotional reactions, physiological patterns for definite stimuli were evident.

The techniques of the analysis of variance and covariance are applied to psychological data and are found to be most useful. Correlations of measures and the differences between these correlations, along with differences between regressions, are tested for significance by the analysis of variance and covariance.

Interpretation is given for several aspects of heart rate change, and change in a function of blood pressure along with the presentation of patterns in cardio-vascular response.

The data do not confirm the classical theories of emotion. Several factors are necessary to account for the differences in the patterns of reaction to extreme fear stimuli and esthetically appealing motion pictures, for example. First factor loadings indicate that in some situations, the difference in heart rate is an important aspect of the pattern, whereas in other situations, the duration of a rise in blood pressure is much more significant. Relationships between variables change markedly in different emotional situations.

Unquestionably a plain indicator of emotion does not exist.

Acknowledgment is made for the valuable assistance of Gertrude M. Cox. [15 min., slides.]

11:20 A.M. *Induced Shift of Muscular Tensions During Mental Work.* R. C. DAVIS, Indiana University.

During the performance of mental work the individual exhibits a pattern of muscular tensions distributed over the body. The possibility



of an arbitrary modification of this pattern was investigated while subjects were "mentally" solving arithmetic problems. During half the work periods they were instructed to keep the right arm relaxed. Muscular tension was recorded by the action potential technique from left arm, right arm, and left leg to detect a possible compensatory increase in tension in other regions. As indicated by the records, subjects were able to maintain a certain degree of relaxation in the right arm, but showed no increase elsewhere. On the contrary there was a widespread pattern of inhibition, centered in the right arm. This affected more distant members less, hence produced a new pattern of muscular tension of less intensity and different gradients. [10 min., slides.]

### EDUCATIONAL PSYCHOLOGY

Program arranged in collaboration with the Program Committee of the American Association of Applied Psychologists

Thursday, September 8, 1:30 P.M.

100 Chemistry Building

D. A. WORCESTER, Chairman

1:30 P.M. *Interest in Psychology as Affected by Studying Introductory Psychology.* JOHN W. MCGARVEY, Mount Holyoke College.

To find the effect of studying a course in introductory psychology upon students' interest in psychological subject matter, an interest inventory was constructed (raw odd-even reliability=.96) which contained 180 items based upon the material in the course. The inventory was administered at Yale University to 167 students beginning the course, and 132 students completing the course; and to two groups ( $n=50$  and 78) not taking psychology. Experimental and control groups were equated for average grades in all courses taken the previous year.

Comparison of scores at the beginning and end of the course showed (1) a reliable decrease in interest amounting to over ten per cent, (2) changes in interest rankings of topics, (3) low correlations between interest scores, intelligence and grades in psychology. Comparative effects of two textbooks are discussed. [10 min., slides.]

1:45 P.M. *Habits and Characteristics of "Best" Pupils.* A. J. FOY CROSS, Omaha Public Schools.

*Problem:* Our problem was to determine as far as possible any distinguishing characteristics of those pupils whose performance on a standardized test of knowledge on current affairs as reported in the press was better than that of ninety-nine per cent of 5,288 junior-high grade pupils to whom the test was given.

*Procedure:* Very complete reports of habits and characteristics of the experimental and control groups were obtained and analyzed.

*Results:* Discussion of results deals with (a) sex differences, (b) health, (c) academic rating, (d) social adaptability, (e) home environment, (f) occupation of parents, (g) interests, (h) hobbies,

(i) reading activities, (j) radio-listening interests, (k) general use of leisure time, (l) vocational interests, (m) general intelligence ratings.

Our results lead us to the conclusion that the habits and characteristics of this select group are, very obviously, "normal." [10 min., slides.]

2:00 P.M. *Analysis of High-School Student Leadership.* MADALINE KINTER REMMLEIN, National Education Association.

The study comprised two problems: (a) Is office-holding an indication of leadership; (b) Is such leadership specific or general?

Numerical values assigned to student-offices provided a "leadership" score. 783 high-school students were then compared in eight secondary characteristics.

Only in scholarship was a significant difference found between office-holders and non-office-holders. Holding office is not in itself an indication of leadership since office-holders are more heterogeneous than non-office-holders.

However, the level of these secondary qualities increases with the extent and diversifications of the offices held. If leadership be defined as holding many and varied types of offices, these secondary characteristics are valid bases for differentiation between leaders and non-leaders.

The overlapping of types of offices in the fields of dramatics, journalism, athletics, and student-body offices suggests that some common characteristic runs throughout. Only fourteen per cent specialized in a single field; the trait may be said to be general. [10 min.]

2:15 P.M. *An Experiment in Controlled Remedial Reading Using Film Materials.* MAURICE E. TROYER, Syracuse University.

Experimental and control groups of 38 pupils each were equated by the paired method on the basis of sex, chronological age, mental age, reading speed, visual acuity, and the Gates Silent Reading Tests, Form I. The experimental factor constituted three 30-minute practice periods per week for six weeks on stories and nature study materials projected from motion picture films in successive phrases. The students were tested during the practice period at the end of each reading exercise. Individual progress charts were kept by the pupils. The median gain of the experimental group over the control group as shown by the Gates Test, Form II, was 12 months. Gains in speed were most marked among the better readers.

This experiment was carried by June Foy under direction of the writer and Dr. W. E. Young in two elementary schools in Syracuse, New York. [10 min.]

2:30 P.M. *Prediction of Ability and Disability in Reading.* ARTHUR I. GATES, Teachers College, Columbia University.

Results are based on more than a hundred different tests and examinations given to four classes of pupils on entering school, at mid-year, end of year and middle of the following year for purposes of determining the factors associated with achievement and difficulty in primary reading.

Tests of intelligence, vision, hearing, range of information, vocabulary, visual and auditory perception, memory, phonetic skills, familiarity with letters and words, ability to interpret pictures, tell stories, write, spell, speak, follow directions, etc., and ratings of previous training, home background, emotional stability, health and vigor, social maturity, etc., were employed. The results suggest the importance of (a) examining pupils carefully to determine the "readiness" for beginning reading; (b) making special provisions for certain handicaps such as defective hearing; (c) introducing a program of prereading instruction for many pupils; (d) providing individualized instruction and frequent diagnostic examinations for all pupils during the first year, and (e) in general, a shift from the current practice of detecting and correcting defects in the second or later years to a plan of testing and treatment to prevent disabilities. [15 min.]

2:50 P.M. *Improving the Reading Ability of College Students.* A. R. LAUER, L. K. HENRY, and M. F. FRITZ, Iowa State College.

The purpose of the investigation was to test and compare various methods of procedure in attempting to improve the reading ability of college students.

Four methods were employed: First, instruction and motivation in which the students were given suggestions for improving their ability and encouraged to do so. Second, instruction and motivation plus a home study project in which the student timed himself while doing a portion of his regular studying and plots his record. Third, instruction and motivation plus group practice in reading mimeographed sheets. Fourth, instruction and motivation plus group practice in reading from the Metron-O-Scope, a three stage tachistoscope designed to improve the efficiency of the eye movements. Comparisons were made with a non-practical control group.

Three criteria of improvement were employed: Section six of the Iowa Silent Reading Test, Form A and B, the Minnesota Speed of Reading Test for College Students, Form A and B, and eye movement records as obtained from the Ophthalm-O-Graph.

Definite improvement was found by all methods of training. However, the number of fixations and the number of regressions of the eyes increased in all groups except the one trained on the Metron-O-Scope. Further analytical data from the experiments will be reported. [15 min., slides.]

3:10 P.M. *The Effect of Written Tests upon Achievement in College Classes: An Experiment and a Summary of Evidence.* VICTOR H. NOLL, Rhode Island State College.

A few studies of the effect of occasional written tests upon achievement in college classes have been reported. The evidence from these investigations is sometimes inconclusive and conflicting. On the whole it is negative in that periodic testing seems to have no effect on final achievement in the course as measured by comprehensive examinations.

An experiment was conducted with two beginning classes in educa-

tional psychology. One had four written tests lasting from ten minutes to an hour, in addition to one hour mid-semester and two-hour final examinations, both objective. The other class had only the two examinations. Thirty-three pairs were equated in terms of intelligence and scholarship. The results, as measured by the two examinations show a slight but consistent superiority for the no-quiz group. There is a suggestion that less able students are helped more by quizzes.

Students in the no-quiz group filled out a questionnaire at the end of the course. More than half said they would have liked the course better, and 78% thought they would have done better work if occasional short written quizzes had been given.

The results of this and previous studies may be summarized as follows:

- (1) Students in college classes do not achieve more on comprehensive objective final examinations as a result of taking occasional written tests.
- (2) Less able students seem to profit more by such tests, as judged by final achievement, than brighter students.
- (3) Instructors and students generally believe that written tests in college classes improve achievement. [15 min.]

3:30 P.M. *Intercorrelations Among Learning Abilities.* RICHARD W. HUSBAND, University of Wisconsin.

Two series of experiments were run. In the first, 100 college students were tested individually on 17 different tests of learning and memory, each subject serving three hours. Tests were divided among motor, rote learning, and ideational learning functions, to obtain an all-around sampling of each individual's various learning abilities. The order of tests was the same for all subjects, and was carefully arranged to vary the consecutive tasks, and to minimize possible transfer and retroactive inhibition.

In the second experiment, the number of tests was reduced to six, but each was increased to about four times its previous length, to see if the low intercorrelations which appeared in the first experiment might have been due to the comparative shortness of tests. Eighty subjects were used for two hours each.

The major results were: (1) Intercorrelations among the different tests were very low, the median correlation being  $+.25$ . (2) Coefficients were slightly higher between tests of largely similar nature, giving a slight suggestion of group factors. (3) When the tests were lengthened the correlations failed to be increased to any extent. (4) Correlations between speed of learning and intelligence were very low. (5) As a final conclusion, we must realize that we should speak of learning abilities, in the plural, since intercorrelations are so low that there is no evidence of a general factor. [15 min.]

3:50 P.M. *The Effect of Instruction on Pupils' Attitudes Towards Agricultural Policies.* H. H. REMMERS and L. D. WHISLER, Purdue University.

Upwards of 1,000 junior high school pupils were subjected to a controlled experimental procedure to measure the effect of three articles

favorable to conservation and planned farming on pupils' attitudes towards five agricultural policies. The experiment was set up to measure any cumulative effects of instructional material on average shift of attitudes and variability. The attitude variables were related to other variables such as rural *vs.* urban residence, intelligence, age, and also to each other. Pertinent comparisons were made with previous similar experimentation with senior high school pupils predominantly rural in residence. Somewhat different effects were noted with rural junior high school pupils as compared with urban pupils.

In general, reliable shifts in averages and spread were obtained, with indications that the effects for the three articles were cumulative, the first one read producing the greatest shifts. In contrast with experiments using senior high school pupils, the present experiment showed some positive relationship of attitude shift with I.Q. The attitudes concerning the five attitude objects were found to be loosely integrated as shown by intercorrelations.

Psychological implications of the results are discussed. [15 min.]

#### EXPERIMENTAL PSYCHOLOGY

Thursday, September 8, 1:30 P.M.

*Social Administration Auditorium*

S. W. FERNBERGER, Chairman

1:30 P.M. *A New Chronoscope.* R. E. DUNFORD, University of Tennessee.

The chronoscope measures nine simultaneous or nine successive reactions.

The chronoscope is powered by a synchronous motor (110 V.—A.C.—60 cycles). The motor turns a shaft on which there are ten pointers and a graduated wheel. In operation all pointers are at rest until released by electrically operated catches. Release permits the pointers to rotate with the shaft. Released by successive impulses, S and R, the separation of the pointers is converted into time by the use of a vernier scale on a graduated wheel reading to milliseconds. Fixed indexes for each pointer are so adjusted that simultaneous release of two or more pointers by the same electrical impulse will bring coincidence of released pointers on their respective indexes. Thus the instrument provides its own immediate test for errors other than variation in current frequency. [10 min.]

1:45 P.M. *Color Constancy, Conversion, Contrast and Adaptation.* HARRY HELSON, Bryn Mawr College.

According to classical views and present-day theories, the mechanisms mediating these phenomena are more or less independent. No two writers agree on the exact relationship between constancy and contrast, conversion and constancy, etc. By using fairly homogeneous light and subjecting observers to only one illumination we find simultaneously illumination colors, complementary colors and retention of daylight colors



both with non-selective (achromatic) and selective samples. Our explanation assumes only that in any illumination there is established a region of achromaticity corresponding to a certain reflectance. Samples above this reflectance have the illumination color while samples below have the complementary color. Samples near the 'achromatic point' are achromatic. The principle holds for all illuminations, including mixed or white light. Data will be presented to show how the achromatic point and hence all hues change with change in background.

It will be shown that contrary to the usual view 'chromatic' colors show more constancy in chromatic illuminations than 'achromatic,' the former regaining their daylight appearance when less than one per cent white light is mixed with spectrally homogeneous radiation. Ninety-six fold increase in intensity of illumination leaves hue, saturation and lightness of colors practically constant. The fact that aperture colors obey the law formulated above makes untenable the view that aperture and surface colors are mediated by different parts of the visual mechanism. [15 min., slides.]

2:05 A.M. *Psychophysical Approaches to the Analysis of Timbre.*  
DON LEWIS, State University of Iowa.

Through the use of a multi-harmonic audio-frequency generator of special design, measurements have been made, among other things, of what are called *masked absolute thresholds* and *masked differential thresholds*. When a single harmonic of given frequency and phase is raised in intensity level until it is barely perceptible in the presence of other harmonics of known frequency, intensity, and phase, its intensity level at that point is called its masked absolute threshold for the conditions specified. The amount that a single harmonic, already at or above its masked absolute threshold, must be raised in intensity in the presence of other harmonics to give rise to a just perceptible change is called its masked differential threshold. Masked absolute and masked differential threshold values are held to be measures of the sensitivity of the ear to timbre differences.

Accumulated data show that discrimination varies with both frequency level and intensity level, in addition to its variation with harmonic structure. Of particular interest has been the finding that masked absolute thresholds vary with phase. Difference and combination tones are undoubtedly largely responsible for this variation. In fact, apparently because of interference between objectively-introduced and subjectively-generated frequencies, it has been possible, depending upon phase, both to reinforce and to cancel out subjective tones. Reinforcement indicates the operation of constructive interference; cancellation, the operation of destructive interference.

All of the results, only a few of which can be summarized in this paper, throw new light on the basic factors underlying the perception of timbre. Further, the results have a direct bearing on what is known about auditory masking and subjective tones, and add to this knowledge. (Dr. M. J. Larsen collaborated in these investigations.) [15 min., slides.]

2:25 P.M. *The Colors of the Positive After-Images Following Momentary Chromatic Stimulation.* SIDNEY M. NEWHALL, Johns Hopkins University.

The experimental problem was to specify the colors of the Purkinje, Hering, and third positive after-images under conditions which would permit comparisons among these colors and discovery of their dependencies on original stimulus characteristics.

The method included the elicitation of the after-images by 0.2 sec. stimulation of a paramacular area. Specification was accomplished by projecting the image so induced to the dark viewing plane of a specially designed tristimulus colorimeter and there matching to it the primary image of the known colorimetric mixture. The same type of technique had been successfully applied to the measurement of the blue arcs of the retina. In case of either class of image, this is essentially the 'objective' method of direct perceptual match.

The results are expressed in terms of the closest available colorimetric analogues of hue, saturation, and brilliance. Curves will be presented showing these color fundamentals as functions of the quality and the intensity of the stimulus. Non-complementary relations of certain so-called complementary images are apparent, and critical regions of transformation from the Purkinje to Hering phase are revealed. Implications for the physiological primaries will be suggested. [15 min., slides.]

2:45 P.M. *Factorial Analysis of Fine Motor Abilities.* ROBERT H. SEASHORE, Northwestern University, and CLAUDE E. BUXTON, State University of Iowa.

Previous studies of fine motor abilities have suggested six possible types of determiners of the observed individual differences: (1) a general motor factor, (2) group motor factors, (3) transfer from previous motor learning, (4) variations in behavior patterning (work methods), (5) specific training, and (6) gradual differentiation of specific from general coordinations. The usual low level of correlation (circa .20) among motor speed tests precludes the possibility of any significant general factor, but the occasional narrow clusters among similar tests suggest group factors which might be more clearly demarcated by Thurstone's factorial methods.

The present battery of 21 tests included: (1) Stanford motor skills unit (pursuit, tapping, speed drill, spool packing, serial discrimination), (2) reaction times (visual press, visual jump, auditory press, auditory jump), (3) eight tapping and allied tests, (4) Miles ataxiometer (sitting, standing), and (5) Minnesota mechanical abilities tests (assembly, spatial relations). Subjects were 50 college men, given controlled practice on each task and tested individually. Ivan N. McCollum collaborated.

Tentative identifications of factors are: (1) *repetitive* forearm speeds, e.g. tapping, (2) unidentified, (3) *simple* forearm-hand reaction times, visual and auditory, (4) *repetitive* finger-hand speed, (5) steadiness in coordination of gross (esp. trunk), musculatures, and (6) forearm and hand manipulations in tasks necessitating perception of spatial relations.

Identifications in this study are made difficult by the presence of several "inconsistent" loadings, but they afford leads for bringing order into a little known field.

The narrow clusters of loadings observed may be interpreted to support a group factor hypothesis of motor abilities. Extensive related experiments permit further evaluations of the extent to which group factors in performance may be determined by biological factors and/or factors listed in hypotheses 3 to 6 previously cited. [15 min., slides.]

3:05 P.M. *The Frequencies of Occurrence of Associated Words.* B. F. SKINNER, University of Minnesota.

One of the important conditions under which a given verbal response is likely to occur is the presence of an appropriate verbal stimulus, as illustrated by the ordinary word-association experiment. The relative frequencies of the words evoked by a stimulus-word may be said to describe the associative capacity that it possesses under current normal usage. An analysis of word-associations obtained by Schellenberg (1929) from 500 college freshmen using a list of 250 new words confirms a previous study of the data of Kent and Rosanoff (1910) in showing a highly uniform relation between the frequency and the rank order of an associated word. Prediction is satisfactory for words occurring as rarely as once or twice in five hundred words. A significant difference in the slope of the line relating frequency and rank order is tentatively ascribed to the homogeneity and the average size of vocabulary of the groups. While there is probably some relation between this result and Zipf's work on word-frequencies in standard speech, the present analysis differs (1) in avoiding the arbitrary definition of a unit of speech, (2) in being independent of the size of the sample within much wider limits, and (3) in leading to a more plausible statement in terms of the verbal behavior of the organism. (The analysis of the data kindly supplied by Professor Schellenberg was carried out with the coöperation of Mr. Stuart Cook. [15 min., slides.]

3:25 P.M. *The Relation between the Goodness of a Performance and the Total Constellation of Its Objective Conditions.* HERBERT WOODROW, University of Illinois.

As a result of the study of a number of conditions affecting simultaneous letter span, it has become clearly established that the effect of varying any one condition depends upon the total constellation of conditions. The conditions which have been varied in combination with each other are the following: exposure-time; number of letters simultaneously exposed; degree of illumination; spatial separation; and pattern. The procedure has been to determine the effect, on the percentage of letters correctly named, of one or more fixed changes in one of these conditions at various levels of difficulty produced by variation in the other conditions. The original percentage right scores were transformed into  $x$  scores, each  $x$  being the sigma value in a normal distribution corresponding to the percentage right. Because they were found to yield

steps which corresponded in relative magnitude with those yielded by Thurstone's method of absolute scaling, these  $x$ -values were used as measures of difficulty.

The result obtained is that the effect of a fixed difference in any one condition decreases with increase in the level of difficulty at which the difference is introduced. The rate of change in this effect is negligible when the fixed difference is relatively small and the levels of difficulty explored are low, but becomes very pronounced at the higher levels of difficulty. A law, believed to be rational, which fits the obtained data, is one expressed by a curve which may be considered to be logarithmic except that the change in difficulty with variation in the favorableness of the total constellation of the objective conditions is subject to resistance or limitation which becomes progressively greater with approach towards either the upper or the lower limit of performance. [15 min., slides.]

3:45 P.M. *The Compression of an Absolute Scale.* JOHN VOLKMANN, Columbia University.

Under most circumstances an absolute scale tends to coincide with the particular range of stimuli which the observer is judging; when this range is expanded or contracted the scale expands or contracts in proportion. (The stimulus-range is defined as the difference between the highest stimulus-value and the lowest.) What happens, however, when the stimulus-range is very greatly reduced, and discrimination is thus forced to its limit?

Three observers judged the inclination of lines of light, exposed one at a time in a dark box. The judgments were made in six absolute categories ("one" to "six"). The stimulus-range varied from  $48^\circ$  of inclination, a range easy to judge in six categories, to  $4.5^\circ$ , a range exceedingly difficult to judge.

The scale at first contracted at the same rate as the stimulus-range; it then contracted at a decreasing rate, as if it were approaching a limit of compression. The latter finding is interpreted as the result of a gradual displacement of the six-category scale by either or both of two five-category scales, "one" to "five" and "two" to "six." Analysis of the data shows this process of displacement. With still further reduction in stimulus-range the scale-width returned abruptly and with some irregularity to a decreasing course; at approximately the same point the frequencies in the end-categories tended to increase abruptly. These findings are interpreted as the result of the breaking of the scale into several disconnected portions. The observers sometimes judged the end-stimuli as "one" or "six," if they believed them to be end-stimuli, even though the absolute scales did not actually contain six categories. The consequence is an artificial narrowing of the scale. [15 min., slides.]

## VOCATIONAL PSYCHOLOGY

Program arranged in collaboration with the Program Committee of the American Association of Applied Psychologists

Thursday, September 8, 1:30 P.M.

Chapel, University Hall

R. A. BROTEMARKLE, Chairman

- 1:30 P.M. *Employment Trends in Applied Psychology.* F. H. FINCH, State Department of Education, and M. E. ODOROFF, State Board of Control, St. Paul, Minnesota.

The data for this study were taken from directories of the American Psychological Association for the years 1916, 1921, 1926, 1931, 1936, and 1938. All persons listed in these directories were classified as to the type of work in which they were engaged. The positions of those whose listings indicated that they were devoting full time to some type of psychological work other than teaching were assumed to be in applied psychology. The number of members and associates in such positions increased from 24 to 694 during the twenty-two-year period studied. The former figure represents approximately 9% of all psychological jobs listed in 1916; the latter, 36% of those listed in 1938.

Details regarding trends as to the types of jobs in applied psychology and the employers of applied psychologists will be presented. [10 min., slides.]

- 1:45 P.M. *Study of Inter-relation of Items on Bernreuter Personality Inventory and Strong's Interest Analysis Test, Part VIII, and Their Relation to Success and Failure in Selling Casualty Insurance.* MARION A. BILLS, Aetna Life Insurance Co., and CHARLES M. DAVIDSON, Life Office Management Association.

An item analysis of the Bernreuter Personality Inventory and of the Strong Interest Analysis Test, Part VIII, has been made from the questionnaires of 300 casualty salesmen, including 150 successes and 150 failures, and divided equally by age groups of under 25, 25-29, and 30 and over. All of these men filled out the two questionnaires between January, 1933, and December, 1935. They were rated in the summer of 1937 by their managers or the men directly in charge of their work on their success or failure in selling over the period from the time that the test was taken to that date. The correlation of the two tests with each other and the correlation of selected items from the two tests with each other are given and a general analysis of the relation of the responses made to success or failure in selling. [10 min.]

- 2:00 P.M. *Employee Selection Tests for Radio Assemblers and Electrical Fixture Assemblers.* JOSEPH TIFFIN and RUSSELL GREENLY, Purdue University.

The present studies on radio assemblers and electrical fixture assemblers are reported together because both groups contain only female



operators, both types of work require hand and finger dexterity and both types of operation require approximately the same degree of training for skilled performance.

Forty-two radio assemblers were rated in efficiency by their department foreman, line foreman, former line foreman and plant personnel director. The average ratings of the four raters had a reliability of .77. The operators were then given a battery of tests consisting of the Key-stone tests of visual ability, O'Connor finger and tweezer dexterity tests, and special tests of finger fatigue and monotony which will be described and demonstrated. The results indicate the relative extent to which each of the functions tested is related to rated efficiency, and also the manner in which variations in these functions among the subjects are related to experience on the job and age of the operator.

Sixty electrical fixture assemblers were given the same battery of tests and, in addition, the Otis Advanced Test of Mental Ability (20 minute form). Standard hour production measures were available for these operators. The test results were correlated directly with this objective criterion of efficiency and the relative importance of the six tests for this type of work was obtained.

The results indicate that all of the tests chosen for experimentation are related in *some* degree to efficiency on the job, whether the criterion was pooled ratings or standard hour production scores. The tests differ considerably in the *amount* of relationship with the criterion. The results will be evaluated from the practical standpoint, with particular reference to the combination of tests most serviceable to an employment manager who hires operators of the type studied. [15 min., slides.]

2:20 P.M. *Implications of Industrial Selection by Tests.* GLEN U. CLEETON, Carnegie Institute of Technology.

A battery including tests of (a) motor coördination, (b) intelligence, and (c) emotional attitudes was administered to 2,246 applicants for a semi-skilled industrial job. From this number, 849 men were selected for training, and 546 successfully qualified for service.

The median test scores for men who qualified were (a) motor ability, 75.5; intelligence, 38.2; emotional attitudes, 77.9. The median scores for men who were dismissed from training because of apparent lack of ability were: (a) motor ability, 61.3; intelligence, 37.4; emotional attitudes, 77.6. There is an obvious difference in the validity of the three tests favoring the motor coördination test.

From the data obtained it was possible to establish prediction ratios for different levels of ability as revealed by tests. For example, it was found that the ratio of failures to successfully qualified candidates was 1 to 4.51 for the highest-score group, and 1.42 to 1 for the lowest-score group. These ratios provide a basis for determining the total number of candidates that must be selected to eventually secure 100 qualified workers.

Experience in administering these tests over a period of years, 1934 to 1938, suggests three conclusions not pertinent to the validity of the tests, but which have important social implications. (1) Ability required on specific jobs is not possessed as widely as is ordinarily assumed.

- (2) With changes in the available supply of potential workers, the ease or difficulty of securing persons with the required ability varies.
- (3) Problems of occupational adjustment are likely to be multiplied rather than reduced by widespread use of tests in industrial selection, unless there is close coordination of the employment activities of firms using the tests. [15 min.]

2:40 P.M. *Thirty Studies of Occupational Abilities.* C. L. SHARTLE, United States Employment Service.

Thirty studies involving 2,500 subjects have been completed in developing measures which are related to success in individual occupations and in "families" of similar occupations. The method of cross validity is used whereby the weighted predictors developed for one sample are checked on other samples in the same occupation and on samples in apparently related occupations. Emphasis is placed on the use of objective criteria.

Results will be reported for department store selling, machine and non-machine clerical work, and for certain manipulative occupations. [15 min.]

3:00 P.M. *The Occupational Orientation Inquiry.* G. A. WALLAR, Iowa State College.

The Occupational Orientation Inquiry is a counseling technic for use with students whose vocational goals are not commensurate with their abilities. While the inquiry has manifold functions, one of its most useful is to help college students of low ability realize their inadequacy for the professions and to help them adjust their vocational plans to their capabilities.

The underlying assumption is that the counselee's attitude toward himself and possible jobs is of major importance. The inquiry consists of a history of the subject's experience and interests; the subject's self-ratings on knowledge, interest, ability and opportunity for placement in 225 jobs; and the student's evaluation of his total possibilities in several occupations.

Ratings made by 600 college freshmen are analyzed to show actual work experiences, interests, estimates of ability and placement opportunities. Interesting patterns of similarity based on these data are presented. Case histories illustrate various applications. [10 min.]

## ROUND TABLES

THURSDAY, SEPTEMBER 8, 4:00 P.M.

1. *Factor Analysis*. T. L. KELLEY, *Chairman*. 100 Derby Hall. (L. L. Thurstone will open the discussion.)
2. *Frustration as an Experimental Problem*. SAUL ROSENZWEIG, *Chairman*. 109 Derby Hall. (Discussion participants: Roger Barker, Stuart W. Cook, Quin F. Curtis, George Haslerud, J. McV. Hunt, Carlyle F. Jacobsen, O. H. Mowrer, and B. F. Skinner.)
3. *Trends in Intelligence Tests and Testing*. FRED KUHLMANN, *Chairman*. 102 Derby Hall. (Discussion participants: Rose G. Anderson, J. W. Dunlap, and Grace H. Kent.)

## INFORMAL TEA

THURSDAY, SEPTEMBER 8, 4:00 P.M.

GRAND LOUNGE, POMERENE HALL

HOSTESSES: GAMMA PSI KAPPA

## SECOND SESSION

THE NATIONAL INSTITUTE OF PSYCHOLOGY, INC.

H. M. JOHNSON, *Chairman*

THURSDAY, SEPTEMBER 8, 4:00 P.M.

103 DERBY HALL

## ANNUAL BUSINESS MEETING

OF THE

AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.

JOHN FREDERICK DASHIELL, *President*

THURSDAY, SEPTEMBER 8, 8:00 P.M.

CHAPEL, UNIVERSITY HALL

## GROWTH AND DEVELOPMENT

Friday, September 9, 9:00 A.M.

100 Chemistry Building

L. S. HOLLINGWORTH, Chairman

9:00 A.M. *The Effect of a Constant and Superior Environment upon the I.Q.'s of One Hundred and Seventeen Children.* RALPH T. HINTON, JR., Mooseheart Laboratory for Child Research.

The work of Freeman, Wellman, Crissey, Skeels, Dawson, and others appears to have given rise to the general feeling that the I.Q. changes with environment. Inasmuch as the very meager material in the literature is always being generalized in educational circles, it seems time for specific contributions to be made in this field. The present study marks such a contribution.

The Mooseheart environment is as constant as is possible to maintain. Moreover, a parental survey indicates that it is socially greatly superior to the children's former surroundings. The present study concerns 117 boys and girls who have lived at Mooseheart for several years and have been given repeated Stanford-Binet examinations. The subjects ranged in age from 2 to 14 years when first tested at time of entrance, the I.Q. range being 65 to 130. The I.Q.s at entrance from the inferior home surroundings were compared to those for succeeding years in the superior environment of Mooseheart.

In general, the results show no reliable difference between the entrance I.Q.s and those of the following five years. This is also true even when we differentiated in regard to the magnitude of the I.Q.s. However, when the children were divided into age groups a significant difference was found between older and younger subjects. The I.Q. increase of very young children after several years at Mooseheart was significantly greater than the increase for older children over the same period of time. [15 min.]

9:20 A.M. *Mental Development and Cultural-Economic Factors: A Nine-Year Study.* HAROLD E. JONES and NANCY BAYLEY, University of California.

Intelligence tests (the California Infant Mental Scale, California Preschool Mental Scale, the Stanford-Binet and the new Stanford Form L) were given seriatim to from forty to sixty children at one month intervals during infancy, and at three, six, and twelve month intervals in later childhood, through nine years. Mental scores are considered in relation to measures of parents' education, occupation, family income, social and cultural ratings, and other environmental factors. The mental and social records extend from September, 1928 to May, 1938.

The data are analyzed in terms of (1) successive cross-section correlations, (2) mental growth curves of individuals classified according to economic and social variables. The factors considered show predominantly slightly negative correlations with mental scores at each age from

one to eighteen months. Correlations increase thereafter, reaching a peak at from four to five years, and maintaining relatively uniform values to the last age level included. Relationships to environmental factors are also shown by the divergence, beginning at about two years, of growth curves of individuals from different socio-economic classifications. Support is given to the view that these relationships are (1) complexly determined, (2) attributable only in part to the direct influence of the environmental factors considered. An analysis of the individual curves reveals (in addition to fluctuations due to unreliability of measurement) striking instances of (1) systematic upward trends, (2) downward trends, and (3) cyclical changes; in a series of cases, these variations in mental growth are unrelated to any known concomitant changes in the environment. [15 min., slides.]

9:40 A.M. *The Emergence of Mental Abilities.* T. W. RICHARDS, Samuel S. Fels Research Institute, Antioch College.

The theory of multiple factors suggests that there are probably several abilities underlying adult performance in mental tests. It is of considerable interest to inquire whether there is evidence of these abilities in childhood and infancy, or whether the adult abilities seem to arise from or become superimposed upon a cruder matrix of ability. To this end several sources of data have been consulted in an attempt to describe in some measure a theory of development of abilities. Most of the experimental data have been obtained in the longitudinal study of a single group of children, by methods of factor analysis and multiple correlation involving (1) fetal activity, (2) Gesell schedules at 6, 12, and 18 months and (3) later mental status. Specifically the findings indicate that Gesell performance early in infancy may be related to fetal activity measured as amount of time active, and that mental status at two and three years is definitely correlated with performance in infancy. Factor analysis of the intercorrelation of test items at six, twelve and eighteen months suggested that two factors, a motor factor and an alertness factor, are present during this early postnatal period. There is some evidence that other factors are beginning to appear. The material is summarized in relation to studies in the literature which tend to confirm or confute the thesis that specialized abilities emerge from abilities of a more general nature. [15 min., slides.]

10:00 A.M. *Variations in Pulse, Respiration, and Limb Movements During Certain Phases of Infant Behavior.* H. M. HALVERSON, Yale University.

Costal and abdominal respiration, pulse, and arm and leg movements were recorded kymographically during quiescence, play, fretting, crying, hunger, feeding, satiation, going to sleep, sleep, and awakening. Respiratory responses were recorded by two very light and sensitive pneumographs which communicated with recording tambours. The pulse was obtained from the fontanel by means of a specially constructed tambour. Limb movements were also recorded pneumatically by attaching sensitive rubber capsules to the wrist and knee. Although the infant, completely



undressed, lay in an experimental crib, there was no interference with his daily routine. The present paper discusses and illustrates the differential responses in pulse rate, respiratory rate, depth and variability of inspiration, and number, extent and character of arm and leg movements of 14 infants between the ages of 2 and 24 weeks. [10 min., slides.]

10:15 A.M. *Quantitative Behavior Analyses in Longitudinal Studies of Infants.* MYRTLE MCGRAW and A. P. WEINBACH, Columbia-Presbyterian Medical Center.

Those who have employed the longitudinal method for studying development in children have experienced difficulty in handling their data mathematically or intellectually. This difficulty is due in large measure to the assumption that records were adequate provided they were made upon the same child subjects at intervals sufficient to embrace any newly developing activity. Data accumulated at such intervals, even if collected over a period of years, yield only a few isolated points on a given subject. Such isolated points do not lend themselves to mathematical manipulation or interpretation.

It is the contention of the present paper that if observations are made at intervals sufficiently frequent as to indicate a base line before any outstanding changes in the behavior occur, then the data can be handled not only to indicate the time when new components of the activity develop but also in such a way that the velocity or rate of development of each component can be ascertained.

Actual numerical values cannot as yet be obtained for some of the most significant types of behavior development in infants. This handicap can to a certain extent be overcome by increasing the frequency of observations and assigning a plus-minus value to small components of each activity studied. Records of a pair of identical twins (observed daily 5 days a week during the first 18 months of life) will be presented. Merits and demerits of the method employed in handling the data will be discussed. [15 min.]

10:50 A.M. *An Objective Investigation of Suggestibility.* MARTIN L. REYMERT and HAROLD A. KOHN, Mooseheart Laboratory for Child Research.

A survey of the literature of the intricate experimental field of suggestibility reveals few even near approaches to complete objectivity, especially in regard to children.

In an endeavor to get an objective estimate of this trait for the Mooseheart child, a new method and technique was devised based essentially upon degrees of suggestibility obtained with pseudo-thermal apparatus and electrical recording devices.

One hundred thirty children of both sexes, ages 5 to 20 years, were tested and retested after several months with this method and technique.

The reliability coefficient derived from various groups ranges from .84 to .99.

Various intercorrelations with other criteria were as follows: chronological age and suggestibility .50, Terman mental age and suggestibility

.50, Terman I.Q. (holding chronological age constant) and suggestibility —.08.

For 115 cases, the percentage of children showing any degree of suggestibility decreases from 91% suggestible at the ages of 5 through 7 rather regularly to 37% suggestible at the ages 17 to 20. [15 min., slides.]

11:10 A.M. *Evaluations Placed on Personality Traits by Boys and Girls at Two Age Levels.* CAROLINE McCANN TRYON, University of California.

Classmates' opinions of each other were collected by means of a verbal portrait-matching technique (Guess Who test) on the same 350 children at the beginning and end of junior high school. Each child's score on each of 20 personality characteristics studied is a function of the number of times he is mentioned. Intercorrelations are obtained between the 20 traits for each of four age-sex groups: boys at 12 and at 15 years, and girls at 12 and at 15 years. The analysis determines what traits, in terms of intercorrelations, tend to cluster and to form similar patterns of relation with other traits for each group. Through the medium of these patterns of relation we seek to determine something of the nature of the evaluations the children have placed upon these traits.

Patterns for girls undergo revolutionary changes from 12 to 15 years; patterns for boys show only minor changes over this age span. For the 12-year-old girl quiet, sedate, non-aggressive qualities are associated with friendliness, popularity, neatness and beauty. For the 12-year-old boy skill and leadership in games, fearlessness and some defiance of adult regulations are prestige-lending qualities; tidiness or marked conformity in the classroom is regarded as a handicap. For girls at 15 trait constellations are more similar to those for boys in that extroverted, aggressive conduct is approved. For boys at 15 tidiness becomes an asset and there is greater emphasis in general on characteristics defining personal acceptability than at 12. However, for boys at this age these traits are highly related to skill in games, fearlessness, etc.; for girls at 15 traits defining personableness and social maturity form a discrete cluster unrelated to other social assets. [15 min., slides.]

11:30 A.M. *Chronological Age and Several Types of Leadership.* HARVEY C. LEHMAN, Ohio University.

What are the chronological ages at which men are most likely to exhibit various kinds of leadership. This article presents age curves which reveal the relative frequency with which the various age groups have contributed to several kinds of leadership—both civilian and military. The procedure that was utilized for the study of military leaders follows. From T. B. Harbottle's *Dictionary of Battles*, the present writer obtained the names of the world's outstanding military and naval commanders and the dates on which these individuals led their armies (or navies) into battle. The birth dates of the leaders were obtained from biographical dictionaries and from several additional sources. Age curves have been constructed which take account of the death rate and which reveal the relative frequency with which each age group has contributed

military and naval leaders. Civilian leadership is less easily evaluated than is military leadership. However, it is possible to determine the frequency with which members of the several age groups have exercised leadership. This has been done for several types of civilian endeavor. [15 min., slides.]

#### CORTICAL FUNCTIONS

Friday, September 9, 9:00 A.M.

*Social Administration Auditorium*

C. W. DARROW, Chairman

9:00 A.M. *The Neural Centers Concerned in the Mediation of Apparent Movement Vision.* KARL U. SMITH, University of Rochester.

The present paper presents results which deal with the question of the functional localization of apparent-movement vision in the nervous system. Responses to apparent movement in cats and guinea pigs were produced by means of stroboscopic illumination of a rotating striated pattern which covered almost the entire visual field. Slow apparent movement of the striated pattern elicited nystagmic eye-movements in the cats, which were recorded electrically by means of a condenser-coupled amplifier and a Westinghouse oscillograph. Similar conditions of stimulation produced nystagmic head-movements in the guinea pigs. These head responses were recorded mechanically by leading a fine silk thread from the tip of the animal's nose to a recording lever on an ink-writing polygraph.

In both the cat and the guinea pig apparent movement of a striated pattern across the visual field is as effective as real movement in producing typical optokinetic orientations to the stimulus patterns. Complete bilateral extirpation of the striate areas of the cortex in five cats did not significantly modify the character of the reactions. In guinea pigs bilateral extirpation of the occipital areas of the cortex (4 animals), hemidecortication (4 animals), and hemidecortication combined with removal of the occipital area of the other hemisphere (2 animals), produced no discernable changes in the response. Bilateral decortication in the guinea pig (2 animals) weakened the reactions to a very slight extent. Inasmuch as the cortical operations described do not abolish the capacity of mammals to respond to changes in stimulation associated with apparent movement vision, it is concluded that responses to apparent movement may be mediated through subcortical centers of vision in the absence of all cortical connections with the retina. Theoretical implications of the results are pointed out. [15 min., slides.]

9:20 A.M. *Cerebral Localization in Somaesthetic Discrimination in the Rat.* DOUGLAS E. SMITH, University of Alberta.

The aim of this study was to determine whether there is localization of somaesthetic function in the rat cortex, and, if possible, to determine the area involved.

A technique was developed in which rats were trained to discriminate the texture of surfaces. A Y-shaped, elevated-path discrimination apparatus was used, in which the rats learned to choose a path covered with sandpaper and avoid a smoothly varnished path. Original training was rapid, and retention after ten days almost perfect. Control tests demonstrated that the discrimination was of surface texture as such.

Results of retraining tests following lesions in the cerebral cortex are available for 25 animals. Of these, 18 fell within the range of normal retraining scores, and were judged to have retained the habit; 4 exceeded the mean scores made in initial training, and were judged to have lost the habit; the remaining 3 were doubtful cases. Large lesions in the frontal pole were associated with loss of the habit. Small lesions in the frontal pole or lesions of any size in any other part of the cortex were not followed by loss.

Thus there is clear indication that somaesthetic function, in so far as it is involved in retention of this habit, is localized within the frontal region of the rat cortex. No exact delimitation of the area involved is possible from the present data. [15 min., slides.]

9:40 A.M. *Bilateral Versus Unilateral Function of the Auditory Cortex.*  
L. A. PENNINGTON, University of Illinois.

Four groups of rats were used to determine the effect of bilateral as opposed to unilateral lesions within the auditory cortex upon (1) acquisition of an auditory localizing habit and upon (2) postoperative retention of the habit. Cortical lesions, localized within the 'critical auditory area,' were produced by means of extirpation procedures. The animals were trained in the localizing apparatus to run toward noise for food.

Results from the group groups of animals permit the following conclusions: (1) Unilateral lesions produced no observable disturbances in postoperative retention tests. (2) Bilateral lesions, symmetrically placed, did produce, however, disturbances in the retention of the localizing habit. (3) Neither unilateral nor bilateral lesions in untrained animals hindered these animals in the original acquisition of the habit. These findings are to be interpreted as supporting bilateral representation of the auditory nerve in the rodent cortex. [10 min., slides.]

9:55 A.M. *Recovery of Pattern Discrimination in Monkeys Following Occipital Lobe Lesions.* H. F. HARLOW, University of Wisconsin.

The purpose of the following experiment was to determine the rôle played by learning (retraining in the specific situation) as opposed to the rôle played by spontaneous cortical reorganization in the recovery of pattern discrimination in monkeys following occipital lobe lesions.

Five rhesus monkeys were trained to make accurate discriminations on seven "string-test" patterns and retention was tested following ten day no-training periods in both a normal environment and in complete darkness. Following these periods, occipital lobe lesions were effected and the animals allowed to recover in complete darkness for ten days. Under these circumstances, relearning dependent upon visual stimulation

could not take place, and any improvement of function would indicate spontaneous cortical reorganization. [Improvement would be indicated by superior performance on the first test day over that of control animals tested on the day of the operation.] Since no improvement appeared following ten days in darkness, but since relearning took place rapidly during the following five test days, the assumption is that experience is essential to the recovery of such functions as were tested.

Data previously obtained by Settlage in which rhesus monkeys were tested on the same "string-patterns" immediately after occipital lobe lesions and after various periods of recovery in a normal (well illuminated) environment were used for purposes of control. [15 min., slides.]

10:15 A.M. *Experimental Analysis of the Effects of Pre-frontal Lobectomy in Man.* WARD C. HALSTEAD, Otho S. A. Sprague Memorial Institute and University of Chicago.

During the past three years at the University of Chicago Clinics, we have been concerned with the analysis of carefully selected human brain cases from the standpoint of the development of objective methodology in this field. Among the cases studied to date are several presenting unilateral or bilateral defect on the prefrontal lobes. These cases have been intensively studied over postoperative periods ranging from six months to two and one-half years. In determining the nature of the defect in the psychological spheres in such cases it has been necessary at some points to develop new methods and apparatus, to which reference is made in the report. (A film partially in color, to be shown in the section for films, illustrates in considerable detail some of the methods used.)

The extent to which the degree of social "recovery" affords an index to the effects of prefrontal lobectomy is considered in connection with such of our cases as have attained an unusual degree of social "recovery" although experimental methods reveal the presence of marked impairment of the higher mental processes.

An analysis of the experimental findings is presented and tentative conclusions concerning the nature of prefrontal in man are drawn. [15 min., slides.]

10:35 A.M. *Observations on Direct Cortical Stimulation in the Dog.* E. A. CULLER, University of Rochester.

A dog, which has previously been conditioned to contract the right semi-tendinosus muscle in reply to a tone, is prepared under complete anesthesia as follows: Both s-t muscles are exposed for observation and freed at the distal ends, with nerve- and blood-supply intact; the left cortex is also exposed for direct stimulation. Appropriate doses of morphine keep the animal quiet and relaxed for testing.

1. A small spot, not over two mm.<sup>2</sup>, can be found on the anterior ectosylvian (aes) gyrus with these properties: so long as the s-t muscle reacts to the tone, it reacts also to direct electric stimulation of this aes



spot; when tonal CR is extinguished, so also is the aes response; when tonal CR is reinstated, the aes response reappears.

2. No other area has been found with these properties; even points one mm. in any direction fail to give these effects. The motor-point for s-t muscle, be it noted, is 20 to 25 mm. distant, near the cruciate sulcus.

3. Dogs tested prior to any conditioning have shown no evidence of s-t contraction from stimulation of the aes area.

4. In some dogs a center, inhibitory of breathing, is found about 5 to 10 mm. behind this area; but the two seem unrelated.

5. It must be emphasized that the phenomenon, which appears with striking clearness in some dogs, has failed to appear at all in other cases, for reasons unknown.

P. S. Shurrager and John D. Coakley have collaborated in this work. [15 min.]

10:55 A.M. *Certain Effects of Auditory Stimulation on Human Brain Potentials.* N. Y. WESSELL and LEONARD CARMICHAEL, University of Rochester and Tufts College.

Simultaneous records from two pairs of electrodes, one pair over the occipital and one pair over the temporal region, were taken on twenty-five subjects during a series of experimental periods in which each subject was given auditory stimuli of known frequency, intensity, and time characteristics. Each subject remained in a shielded and almost completely sound-proof room during the experiments. Records were made photographically, using a two-element Westinghouse oscillograph to record potentials amplified by two non-interfering high-gain condenser coupled amplifiers. Tables are presented showing the electrical characteristics of each electrode placement in relation to each of a standard set of auditory stimuli. It is shown in summarizing these data that the auditory stimulus has no constant effect on the occipital potential, but that certain auditory stimuli do produce demonstrable effects on the potentials in the temporal region. No sure evidence of auditory flicker following comparable to the demonstrated visual flicker following was secured. Alternating auditory flickering of high intensity does in certain cases produce a decrease of frequency and an increase of amplitude in the Alpha rhythm, however. In the temporal placement also some definite positive effects of the onset of stimulation were secured. The significance of these results for the theory of the electroencephalogram will be discussed in relation to the known facts of the electrical phenomena of the auditory mechanism of the central nervous system. [15 min., slides.]

## HUMAN LEARNING, I

Friday, September 9, 9:00 A.M.

Chapel, University Hall

H. A. CARR, Chairman

9:00 A.M. *An Experimental Comparison of Palmar Conductance Curves of Learning, Work, and Rest.* M. M. WHITE, University of Kentucky.

The purpose of this experiment was to determine the relation of the conductance level of the subject to a general "alert" attitude and to a specific set of the subject. Six subjects learned twenty words on six different occasions by the anticipation method. The electrical resistance of the subject was taken throughout. A Vincent type learning curve was constructed for each subject and for all subjects as a group. Curves of conduction were constructed in the same fashion.

A second group of six subjects was required to read aloud, with instructions not to learn, a list of words presented in the same manner and as frequently as for the first group. A third group of subjects was required to rest for approximately the same length of time as the first and second groups worked.

It was found that (1) there is a relationship between the stage of learning and the level of conductance; (2) such relationship is relatively independent of the absolute conductance level; (3) the conductance curve approaches an asymptote as the acquisition of material cases; (4) the recall of a given word is in part a function of the conductance change immediately prior to its recall; (5) the conductance curve during work without learning, after an initial rise, remains on the same level; (6) the conductance curve during rest slowly falls during the entire experimental period. These results also indicate that there is an optimal level of conductance for learning. The writer wishes to record his appreciation of the assistance given by Miss Mary Asher in carrying out this experiment. [15 min.]

9:20 A.M. *The Rôle of Stimulation in Learning.* GEORGE S. SNODDY, Indiana University.

The attempt is made in this paper to bring the findings made by the writer in his various studies on the mirror-vision coördination into relation with current learning theory. The chief difficulties center about the rôle of stimulation and of time. Experimental evidence is presented in the paper showing that the positive, facilitative effect of time occurs when fatigue has not appeared. Thus the contribution of time is not the elimination of fatigue or work effects, as in current theory. Also, when the results of continuous stimulation are compared with results from intermittent stimulation, it is found that the continuous practice group is relatively much higher late in the practice than earlier.

It is held that early in the learning, stimulation is playing a negative rôle and the coördination is actually depressed or shocked down by the stimulus. As learning proceeds a resistance to the shock-effect of the

stimulus occurs and a higher score results. The rôle of interpolated time is then clear since it operates merely to mitigate the shock-effects of stimulation by aiding the upbuilding of an integrated state. This state is found to be relatively permanent since it is always enhanced by time. As soon as the stable growth appears, it begins to act as a base, from which continuous practice produces a highly temporary increment.

These studies seem to require a recasting of our traditional conceptions of learning with respect to the rôles played by stimulation and by time. [15 min.]

9:40 A.M. *Effects of Practice on Judging Various Traits of Individuals.* HERMON W. MARTIN, Emory University.

*The Problem.* The immediate concern of this experimental study has been to determine whether the validity of estimates of certain complex traits of individuals, as well as of certain simpler and more objective characteristics, may be improved by the method of practice and correction. In its broader significance the problem involves the question of the possible effects of practice upon judgments from obscure clues.

*The Experimental Set-Up and Procedure.* A series of five, measurable, distinct traits, affording a wide range of complexity and objectivity, was selected for estimating, namely, (1) height, (2) weight, (3) age, (4) introversion-extroversion, (5) intelligence.

Judges were introduced singly to the assembled judges, were measured for height and weight, and were then seated beside an interviewer's desk while answering six to ten commonplace questions, remaining always in the sight and hearing of the judges. The measures of intelligence and of introversion-extroversion were made prior to the observation-interview period. As soon as a judgee was dismissed, corrections were handed to those judges scheduled to receive them.

*Results.* (1) Typical trial-and error learning curves are found for each of the traits tried. (2) Correlations: (a) Between amounts of practice and of error substantiate the appearance of the curves. (b) Between chance divisions of the judges, for measuring agreement among them, manifest increasing reliability as practice accrues, especially in the case of the experimental group of judges. (3) Estimates of the more complex traits show greater scatter. (4) It appears that, on a basis of brief observation and interview, appreciable improvement may be effected in judging some of the psychological traits, as well as some of the more objective physical features of individuals, when such judgments are regularly practiced and checked by standardized measures. [15 min., slides.]

10:00 A.M. *The Weakening of Word-Number Connections by "Punishment."* RICHARD E. P. YOUTZ, Barnard College, Columbia University.

Thorndike and his collaborators report that the response "wrong" has no weakening effect on word-number connections. In an attempt to test the generality of this finding, six college students were given eight trials on each of three 40-unit word-number lists. To each word the subject gave a number between 1 and 8. The experimenter said "right" or "wrong" according to the number's predetermined correctness.

The 61 word-number connections that were correct in four, five, or six instances during the eight trials were divided into two groups. During another eight trials thirty-word-number connections were treated as before and the per cent correct per trial rose from 47 to 83. Thirty-one connections were answered by "wrong" and the per cent per trial of these previously correct responses fell from 52 to 0. Theoretical implications in the light of Thorndike's and Muenzinger's results are suggested. [10 min., slides.]

10:15 A.M. *The Efficiency of Retention of a Rational Learning Problem Under (1) Normal Conditions and (2) Conditions of Interpolated Learning, for Long Intervals of Time.* M. E. BUNCH, Washington University.

The curve of retention of Peterson's rational learning problem for intervals of 2, 14, 30, and 90 days was plotted for three different conditions: (1) rest; (2) work condition OI—interpolated learning immediately following the original learning; and, (3) work condition IR—interpolation immediately preceding the retention test. The interpolated problem was a second rational learning problem. This experiment was conducted in collaboration with Mrs. L. Bass.

There was retroactive inhibition under the OI condition for all intervals used, although the amount was relatively small after 90 days. Under the IR condition, the influence of interpolation was (1) detrimental for intervals of 2 and 14 days, (2) statistically insignificant at 30 days, and (3) beneficial in character, i.e. positive transfer instead of retroaction, for the interval of 90 days. [15 min.]

10:55 A.M. *Inter-Serial Competition of Responses During the Relearning of Serial Verbal Material in the Retroactive Inhibition Experiment.* ARTHUR W. MELTON, University of Missouri, and JEAN McQUEEN-IRWIN, Scripps College.

The experiment sought to clarify the relationship between the degree of interpolated learning and retroactive inhibition as measured by recall and relearning scores, and to determine the frequency with which syllables from the interpolated list occur as erroneous responses during the relearning of the original list by the anticipation method. Every response of the S was recorded verbatim. Twenty-four college men learned one list of nonsense syllables for 5 trials, rested for 30 minutes or learned a second list for 5, 10, 20 or 40 trials, and then relearned the original list to a criterion of two successive errorless trials.

*Results:* (1) Retroactive inhibition, as measured by recall and relearning scores, was greatest when the interpolated list was learned for 10 trials and least when the interpolated list was learned for 5 or 40 trials. (2) 182 different syllables from the interpolated lists occurred as intrusions during the relearning of the original lists and study of them leads to the following conclusions: (a) The greatest number of intrusions occurred when the interpolated list was learned for only 10 trials; (b) with increases in the degree of interpolated learning the per cent of intrusions obviously based on identity of serial positions declined from 60 to 25, and the per cent of intrusions obviously based on formal identity



of the syllables increased from 19 to 61; (c) the intrusions occur later in the relearning process, the greater the degree of learning of the interpolated list. (3) The interference effect is bidirectional in that syllables from the original list occur as erroneous responses during the learning of the interpolated list.

The significance of these results for the transfer theory of retroactive inhibition will be indicated. [15 min.]

11:15 A.M. *The Effect of Verbal Suggestion in the Recall Period upon Reproduction of Visually Perceived Forms.* NELSON GILBERT HANAWALT, New Jersey College for Women, Rutgers University.

In studies of change in the memory trace the importance of the recall period has been neglected. Carmichael, Hogan, and Walter have shown that reproduction is influenced by verbal suggestion in the learning period. The present study uses their figures and a modification of their method, the chief change being the presentation of the verbal suggestion in the recall period. The results are based upon 1,448 reproductions from 148 subjects.

It is found that verbal suggestion in the recall period, although not as effective as in the learning period, is a definite factor in determining detail in the reproduced form. The strength of this factor increases substantially from immediate recall through an interval of two days, and of one week, the longest delay of reproduction in this experiment.

Acknowledgment is made to Isabelle Demarest for assistance rendered in this experiment. [10 min., slides.]

11:30 A.M. *Some Probable Factors of Ability in the Languages.* J. W. TODD, University of Southern California.

As a sequel to a study of certain assumed "fundamentals" of language ability previously made under the auspices of the Modern Language Study and the American Council on Education on 488 senior high school pupils, indicating general intelligence as the prepotent specific, the present study of 300 university students was undertaken. All were sophomores and as such considered fairly homogeneous as to education and foreign language progress. No differentiations on the basis of sex were attempted as in the earlier study. A battery consisting of tests of general intelligence, level of English vocabulary, reading comprehension and immediate auditory memory span was checked against obtained marks in the academic studies other than the languages; against the marks in the languages, followed by the latter two against each other.

No evidence of a so-called language disability appears in the analyses of the data selected, so that, while language *debility* may exist, it appears that no unique *ineptness* for language learning is to be found. When all accessory factors are equal it would seem that anyone capable of mastering any intellectual task on a given level of difficulty is capable of mastering any other of equal difficulty no matter how dissimilar in content. An adept mathematician could have become an expert linguist in so far as the possession of specific capacities is concerned. For language learning, at least, there seems to appear no "parsimonious frame of reference." [15 min.]



## SOCIAL PSYCHOLOGY

Friday, September 9, 1:30 P.M.

*Social Administration Auditorium*

G. W. HARTMANN, Chairman

1:30 P.M. *Conditioning Away Social Bias by the Luncheon Technique.*  
G. H. S. RAZRAN, Columbia University.

One hundred judges were asked to rate on a 5-point scale 30 photographs of college girls—enlarged on a screen to life size—for beauty, intelligence, character, entertainingness, ambition, and composite general liking. The composition of the judges equalled that of the U. S. adult population in racial and national descent, religious denomination, education, and to some extent also in age and income, but not in geographical distribution. Two weeks later the rating experiment was repeated, but this time 5 Jewish names (Rabinovitz, Finkelstein, Cohen, Goldberg, and Kantor), 5 Italian names (Grisolia, Scarano, Fichetti, D'Angello, and LaGuardia), and 5 Irish names (McGillicuddy, O'Shaughnessy, O'Brien, Kelly, and Flanagan) were attached to half of the photographs, the remaining 15 names being chosen from the signers of the Declaration of Independence and 5 being the most frequent in the Social Register. With the old names as a base, the Jewish names produced the greatest drop in general liking, followed by the Italian and Irish. The bias in character and beauty followed closely that of general liking but was smaller in amount. In intelligence, ambition, and entertainingness, the Jewish names showed a rise, the Irish a small drop, and the Italian a drop in the first and a rise in the last two variables.

The luncheon technique was then applied to 12 of the judges. The items with most bias were presented while the judges were given a free lunch and those with least bias while the judges were hungry. A second rerating showed then a definitely reliable conditioning away or removal of the bias. Its degree of effectiveness was in the order of general liking, character, beauty, entertainingness, intelligence, and ambition. [15 min., slides.]

1:50 P.M. *Occupational and Societal Roles Studied with Relation to the Human Behavior Pattern.* FLOYD H. ALLPORT, Syracuse University.

An attempt is made both to develop methods of defining, observing and describing behavior, and to study the relation of human behavior to human rôles in the cultural pattern. Just as we might observe the various acts natural to a squirrel as they operate in gaining the satisfaction of his needs, so we can study the degree or manner in which natural human activities are released in modern society.

Twelve student investigators were trained to describe units, or acts, of behavior. Working in pairs, they made sample studies in sixteen different situations, including those of ten-cent store clerks, bank tellers, grocery-store clerks, children on playgrounds, machine workers, and

people in homes. Without the knowledge of those observed, a record was made of all acts done by individuals under observation for one half hour. The material obtained was classified into categories, such as slack or busy conditions, repetitive versus continuing behavior, etc., and into a list of human activity-types, such as manipulation, reaction-getting, thinking, and aesthetic performance.

There are indications that there is a larger number of acts of recognizable activity-type in the school playground situation than in the ten-cent store. In number of *different* activity types, home and playground stand relatively low. In mere number of acts, the home situation stands lowest and the chain grocery and bank teller situation stand high. When acts are combined with "telic series" (larger purposefully described units), we find a superiority of home and playground over commercial situations in the variety of these "things which are done." Home and playground show a substantial proportion of consummatory to preparatory acts. These results are subject to revision by further analysis. [15 min., slides.]

2:10 P.M. *Democratic and Autocratic Group Atmospheres.* RALPH K. WHITE, Iowa Child Welfare Research Station.

Lippitt, in a preliminary experiment, studied the psychological effects of democratic and autocratic group atmospheres, with two clubs of ten-year-old children which were set up for this purpose. Adult leadership in one group was friendly, but thoroughly authoritarian; in the other it was "democratic," with a maximum group discussion and group self-determination. Description of techniques and chief results has been published in *Sociometry*. For example, it was found that the amount of hostility between the members of the autocratic group was much greater than in the democratic group.

This preliminary experiment was repeated by Lippitt and White, on a broader scale and with certain improvements in technique. The factor of individual differences, as a possible reason for the group differences, was ruled out by having each of four groups carry on its activities both in autocracy and under democratic leadership. In addition, two groups went through a third group atmosphere, "anarchy" or "laissez-faire," in which the adult stood aloof. A similar systematic variation was carried through with the four leaders, each of whom played the rôle of an autocrat in one group, and in another that of a democratic leader. The changes of group atmosphere with the same children permit a study of the effect of a shift from democracy to autocracy or laissez-faire and vice versa, and the rapidity of adaptation in the different directions. The techniques of determining group atmospheres quantitatively, and their effects, were improved. The atmospheres of the various school and home backgrounds of the children were studied also.

The results are on the whole similar to those of the preliminary experiment, a major difference being that apathy, instead of intra-group hostility, was sometimes the most conspicuous result of the autocratic atmosphere. Large differences were found between laissez-faire and democracy. [15 min.]

2:30 P.M. *Mongolians and Caucasians: Their Physiological Reactions to Emotional Stimulus.* G. M. STRATTON and F. M. HENRY, University of California.

The problem here in mind is whether the emotional reactions of these peoples are or are not different, in situations where cultural differences might be expected to be of little effect.

In all the experimental situations created, the stimulus was given by a large hammer which, being watched in its fall by the subject, struck a resounding blow near his extended hand.

The present report is concerned with the respiratory, circulatory, and psychogalvanic responses of about 150 men, forming three almost-equal groups of Chinese, Japanese, and American Whites.

The data reveal some statistically significant differences between the Mongolians and the Caucasians. In pulse-rate, as in the involuntary flinching of the hand reported hitherto, the Caucasians wherever they significantly differ at all from the Mongolians, show a greater emotional reaction than do the Mongolians. In regard to psychogalvanic change, on the other hand, the Mongolians appear to be more reactive than the Caucasians. No clear differences between these races appear with respect to changes in respiration and blood pressure.

In general the Chinese and Japanese nationalities of the same race differ from each other less than they differ from the Caucasian group.

But on the whole the emotional similarity between Caucasian and Mongolian appears to be more striking than their emotional unlikeness.

While cultural influences were not completely excluded from the experimental results, yet it is not improbable that some part of the emotional difference actually found is due to a difference in innate psycho-neural constitution between the Caucasian and the Mongolian. [15 min.]

2:50 P.M. *The Formation of Opinion.* H. P. WELD, Cornell University.

I report some results taken from experiments made intermittently during the last several years with the coöperation of Dr. Merrill Roff. We presented to a group of upperclassmen the report of the testimony of a criminal trial. At certain points in the reading of the testimony each member of the group was asked to express an opinion of the innocence or guilt of the defendant on a 9-point scale. There were in all 13 judgments; the first, however, was based solely on the indictment, and the last on the announcement of the jury's decision. We have, therefore, 13 opinions for each of 178 individuals.

We shall consider only those results which throw light on the formation of individual opinion. They may be summarized as follows: (1) 57% of all subjects were prejudiced against the prisoner merely by the indictment; others revealed the prejudgment that no decision should be reached until all the evidence was presented. (2) Neither of these prejudices, however, was maintained by any individual throughout the experiment. (3) A succeeding opinion was in several ways influenced by a preceding opinion. (4) In addition to the effect of one or more of the above factors, an opinion was influenced by the evidentiary facts. Some individuals were more easily swayed by new facts than others. (5) The weight

assigned to any particular fact was influenced by such evaluations as the character of the witness, the probability of the evidentiary fact, and its implication of guilt or innocence. (6) The announcement of the opinion of the jury had no effect on 72% of the final judgments; 5% were influenced negatively. [15 min.]

3:10 P.M. *A Quantitative Study of Fad and Fashion Leadership among Undergraduate Women.* J. E. JANNEY, Western College, Oxford, Ohio.

This study is an attempt to test the frequently asserted dictum that fads occur in a *random* manner. Sixty-seven clothing fads and fashions of 279 undergraduate women were observed over a period of two years.

Fads and fashions were found to be highly indicative of both personality patterns within the individual and social patterns within the group. Fad leadership tends to be preceded by, and dependent upon dramatic, choreographic, editorial, or social leadership. It is positively related to the reception of favorable masculine attention. Failure to initiate or follow fads tends to be positively related to social isolation, opinionation, and schizoid tendencies. [10 min.]

3:25 P.M. *Social Prestige Values of a Selected Group of Occupations.* C. W. HALL, Adelbert College, Western Reserve University.

Does a fairly well agreed upon social prestige attach to particular occupations? To investigate this problem, 252 named occupations were printed on small cards. These cards were submitted to a heterogeneous group of 200 adults who were asked to sort the cards into eleven piles according to the social prestige which they personally attributed to the respective occupations.

A hierarchy of 252 occupations, arranged according to their prestige value was obtained. Using only those occupations most closely agreed upon by the judges, two scales of 40 items each have been prepared. A third scale was prepared including the occupations upon which the judges showed the greatest disagreement. These short scales will be used to study differences in appraisal of occupational prestige by fairly homogeneous occupational, political or nationality groups. [10 min.]

3:40 P.M. *Reference Data on Moscow Families of 1935.* BRONSON PRICE, Ohio State University.

A population of 1,380 persons comprised 283 pairs of twins and their available siblings and parents were tested with two Army Alpha number-series-completion forms and two synonym-antonym forms given orally. Fairly complete data on occupational status and on fertility over two generations were secured. The investigation sought to provide a sampling and testing of a Soviet urban population which will allow that check-ups can be made in future decades to study such shifts in means and other indices as may occur with changed conditions.

In respect to the average of the standard scores for the two functions tested, the resemblance coefficient for identical twins is .93 for both sexes, and for like-sex fraternal twins it is .67 for boys and .80 for girls; these

coefficients are lower for the number function and higher for the word function. The parent-child and other resemblance coefficients are in general high, possibly as a consequence of marked homogamy in the parental generation. Marital coefficients of .56 for the number function and .78 for the word function were found for 217 pairs of parents.

Some evidence of sex-linkage in the inheritance of intelligence is suggested in that the sister-sister coefficients are relatively high, while the brother-sister and father-son coefficients are relatively low.

The demographic data show a marked drop in the fertility of this urban group, and one which is not readily explainable in terms of regression alone. Sharp differential fertility is present, apparently due in considerable degree to the 'social promotion of infertility.' [15 min.]

4:00 P.M. *An Example of Quantitative Method in Social Psychology.*

CHARLES I. MOSIER, University of Florida.

The ranks of the fifteen most popular songs of each week were secured from the nation-wide survey of an advertising campaign. From two assumptions a quantitative hypothesis, leading to an exponential growth curve of popularity, is derived. This hypothesis, rationally derived from assumptions, rather than empirically derived from data, is tested by fitting the resulting function to the data for a number of song-titles. The index of correlation, corrected for the degrees of freedom, ranges from .90 to .66. A second hypothesis, similarly derived from a set of assumptions, is also tested and found to conform to the data. It is concluded that, while neither hypothesis can be finally accepted, and others should certainly be tested, the possibility of applying rational quantitative methods to problems of mass-behavior in social psychology is adequately demonstrated. [15 min., slides.]



## PERCEPTION

Friday, September 9, 1:30 P.M.

100 Chemistry Building

A. R. GILLILAND, Chairman

1:30 P.M. *A Study in Inter-sensory Gestalten.* G. M. GILBERT,  
Columbia University.

If consciousness is unitary rather than a composite of independent sense modalities, then sensory Gestalten should be modifiable by the configuration of heteromodal stimuli. The phi-phenomenon was used as the "dependent variable" to test this hypothesis, with auditory stimulation as the heteromodal influence and "independent variable."

Subjects were seated in a light-proof and sound-proof chamber, facing a phi-phenomenon apparatus, and wearing ear-phones. Outside the chamber the experimenter operated the stimulus controls, which permitted variation of rate of stimulation of both auditory and visual stimuli, as well as the temporal relationship (configuration) of the two sets of stimuli. Using the signal keys which illuminated colored bulbs on the experimenter's table, S reported phenomenological responses to the visual stimuli. In this way the range of stimulus frequencies for apparent movement (from alternation to simultaneity) was obtained under varying stimulus conditions.

Wide and consistent differences in range depending on heteromodal influence were obtained for most experimental sessions. In general, simultaneous or exactly synchronized audio-visual configuration facilitated the perception of apparent movement, while an alternating or "out-of-phase" audio-visual configuration inhibited it. In many cases the curves for the range of phi on successive trials under different conditions do not cross at any point. There are considerable individual differences in susceptibility to heteromodal influence, and the influence itself is subject to fluctuation and adaptation in the same S. Calculation of M.'s and S.D.'s for complete series tend to obscure differences which are clear-cut when graphed. The results are interpreted as affirming the unitary nature of the perceptual process, as well as emphasizing the importance of a dynamic rather than a static orientation in psychophysics. [15 min., slides.]

1:50 P.M. *Naïve Subjects' Attempts to Produce 'Good' Configurations.*  
MARIAN B. HUBBELL, Wilson College.

The concept of the 'good' Gestalt, usually taken to include such factors as symmetry and closure, has been widely used as an explanatory concept, but there is need for a direct empirical determination of the precise characteristics of a visual configuration considered 'good' by the average observer. To this end fifty naïve subjects were presented individually with figures of various types, symmetrical and asymmetrical, open and closed, and were instructed to change these figures in any way to make them 'better' if they did not think they were as 'good' as they

might be. As a result, 78% were in some way changed. Subjects, working independently, often produced striking series of progressive changes in the same direction. The most frequent change, occurring in 65% of all figures, consisted in making more differentiated figures, *i.e.* in adding axes, diagonals, connecting lines, etc. The importance of closure is evidenced by the fact that 92% of the open as against 56% of the closed figures were in some way changed, and the fact that closure of the figure was increased in 60% of all cases. Not only were the asymmetrical figures changed more frequently than the symmetrical, but symmetry was increased in 38% of the cases. "Good continuation" of lines, and creation of dynamic properties also occurred. While familiar objects and forms were created in 31% of all figures, closure and symmetry governed five times as many changes as were governed solely by the factor of familiarity.

Differentiation, to counteract too great homogeneity of the figure, has been demonstrated as characteristic of naïve subjects' attempts to produce a 'good' Gestalt, with the factor of closure next in importance. [15 min., slides.]

2:10 P.M. *On Sound Localization.* HANS WALLACH, Swarthmore College.

The binaural cues for sound localization are effective only in determining the angle between a given direction of sound and the axis of the ears (lateral angle). Since there is localization in the median plane, a second factor should be found which determines the direction of sound in this dimension.

Head movement during sound localization might yield such a factor. With head movement the lateral angle of the sound changes giving a sequence of lateral angles characterizing the direction of sound geometrically in *both* dimensions.

That sound localization actually works on this principle was proved by experiments in which directions of sound were synthetically produced. The sequence of lateral angles which a certain elevated direction of sound would yield with a certain head movement was determined. While the observer performed this head movement a sound was shifted in the horizontal plane in a way to present the same sequence of lateral angles. The observer perceived the sound in the direction from which the presented sequence of lateral angles was derived instead of in the actually given shifting position. [15 min., slides.]

2:30 P.M. *Cerebral Mechanisms and Auditory Localization in Dogs.* EDWARD GIRDEN, Brooklyn College.

The L-R auditory habit was established by training dogs to flex a forepaw upon the presentation of an auditory stimulus (buzzer or pure tone) from the right side, but to inhibit this response whenever the stimulus was sounded from the left side. The development of this habit and its retention was studied in several conditions of cerebral extirpation.

The following results seem indicated: The L-R habit persists following complete transection of the corpus callosum, removal of the temporal,

and varying amounts of the parietal and occipital, lobes of one hemisphere. The L-R habit is disrupted only if both the left and right temporal lobes are removed either in one operation or in two successive stages a month apart. If the two auditory areas are removed in successive stages, the conditioned reflexes persist. That is, the dog will still flex its paw to the auditory stimulus, regardless of whether it is sounded from the animal's right or left side. If the bi-temporal operation is performed in one stage, then all auditory conditioned reflexes, as well as the L-R habit, disappears. The cortical area essential for the L-R habit lies within the sylvian gyrus.

The reasons for the contradiction between the present data and the findings of Pavlov, procured by means of the salivary method, are discussed, and evidence is offered that the present data are more in line with present knowledge of auditory theory and indicate the superiority of the motor CR technique in studies involving extirpation of the cerebral tissue. The significance of the present data for the understanding of brain mechanisms in hearing and further research is indicated. [15 min.]

2:50 P.M. *On Musical "Micro Scales" and "Micro Melodies."* HEINZ WERNER, Wayne County Training School, Northville, Michigan.

The present study was performed at the Harvard Psychological Laboratory; the study developed from preliminary work at Hamburg, Germany.

The experiment is concerned with the following question: if the elementary intervals of the tempered scale, the semitones, are reduced to a considerable extent, will these physically reduced intervals become the elements of a new scale and be constructed in this way into a "micro system"?

The subjects of the experiment were first presented with a very small interval, one tone of 700, the other of 705 cycles. The interval was repeated a great many times. A subjective enlargement of the objectively constant interval was reported; a point was reached where the interval had acquired the character of a semitone identical with that of the normal scale. There were great differences between the subjects in the time necessary for the attainment of this maximum increase in the subjective distance of the two tones. An attempt has been made to measure objectively the subjective increase of the tonal distance.

The phenomenon of the transformation of a small tonal distance into a meaningful interval of a semitone provided the basis for the development of a "micro scale." An electric oscillator, connected with a keyboard, was used for producing the tones. Each key of the keyboard corresponded to a tone of a "tempered micro scale"; the basic physical interval was 7 cycles. The subjects were trained step by step to the acquisition of the "micro scale." Part of the experiment consisted in the study of laws of development of this new musical system. Analysis of melodic patterns within this "micro system" revealed structures analogous in many respects to those of our normal musical system. [15 min.]

3:10 P.M. *Fusion Frequency and the Light-Dark Ratio.* ROBERT T. ROSS, Stanford University.

If the relative duration of the light and dark intervals of a flickering test-patch are changed without changing the intensity of the light interval, a series of fusion frequencies may be determined which are functions of at least the light-dark ratio and the apparent brightness of the fused test-patch. A systematic study of the fusion frequency for six levels of brightness, nine values of the light-dark ratio and four different retinal positions of the test-patch have been carried out.

The data show characteristic differences in the relation of fusion frequency to light-dark ratio for different test-patch intensities; they give typical curves for the relation of fusion frequency to  $\log I$ ; they show a reversed effect between fovea and periphery for the relation of fusion frequency to light-dark ratio; and the curves for the fovea are shown to be predictable from other data. [15 min., slides.]

3:30 P.M. *Further Investigation of the Harold C. Brown Shrinkage Phenomenon; a New Approach to the Study of the Perception of Movement.* HEINZ ANSBACHER, New York City.

The phenomenon, first reported by the writer this spring at the Eastern Branch meeting of the A.P.A., consists in the fact that an illuminated arc of one-tenth the circumference of a circle with a diameter of 16", rotating at less than fusion speed, and observed with stationary eyes, will under optimum conditions (*i.e.* relatively great light intensity and speed, 80 r.p.m.) shrink to a mere point, as measured by subjective equations.

The present experiments, consisting in (1) a variation of the rotating arc and (2) replacement of real by apparent rotation, show that the phenomenon is largely determined by physiological factors (stimulus distribution).

The implications for the theory of perception of movement and the theory of vision in general are indicated, and further research is proposed. [10 min., slides.]

3:45 P.M. *Observations on the Effect of Prolonged Inverted Retinal Stimulation upon Spatially Coordinated Behavior in the Rhesus Monkey (*Macaca mulatta*).* JOHN P. FOLEY, JR., George Washington University.

The purpose of the present investigation was to determine experimentally the effect of inverted retinal stimulation upon spatially coordinated behavior when complete retinal inversion is present in all visual stimulation over an extended period of time.

The subject was an adult female rhesus monkey approximately 9 years old. The optical system employed to achieve inversion consisted essentially of binocular astronomical telescopes with detachable lenses mounted in aluminum tubes, the latter threaded securely into the brass bushings of a form-fitting aluminum mask. The mask was held in place by a leather headgear fastened with straps and surgical adhesive, so that no light

could reach the eyes except through the lenses. The interpupillary distance was correctly observed, and the lenses were chromatically and aplanatically corrected so as to furnish a clear, well-defined and maximal field of view at an established fixation distance of 16 inches. The reversing lenses were worn continuously for a period of exactly 7 days. The subject was at first necessarily restrained in a special chair and headholder, being removed for periods of exercise and observation; the restraint was decreased as the subject became adapted to the situation. Observations were made in the form of detailed protocols and by cinematography.

The initial results of the inversion indicated a pronounced interference effect in the case of all visually stimulated behavior, as well as progressively decreasing periods of tonic immobility. No nausea was explicitly observable, in marked contrast to previous results on human subjects. With continued inversion there was a progressive improvement and final complete readaptation of overt localizing responses to the new conditions of inverted retinal stimulation. Upon removal of the lenses, slight interference effects were noted, but quickly disappeared. [15 min.]

#### ANIMAL BEHAVIOR

Friday, September 9, 1:30 P.M.

*Chapel, University Hall*

R. M. YERKES, Chairman

1:30 P.M. *Measurement of Sex Drive in the Male and Female Guinea Pig.* GEORGENE H. SEWARD, Connecticut College.

Ten mature female guinea pigs were compared with ten mature males in an obstruction box requiring the animal to jump a barrier to reach the incentive. Strength of drive was measured by the average time for ten crossings. In the female, crossings during oestrus and dioestrus were compared; in the male, crossings were compared in conditions of satiation and deprivation. Preliminary results suggest a sex difference in the guinea pig. A male drive is apparent in decreased time of crossing following the deprivation period. No corresponding changes were found for the female. This points to the conclusion that in the guinea pig the male plays an active, the female a passive rôle in reproductive behavior.

This study was aided by the National Research Council Committee on Sex Problems, through Cornell Medical College. [10 min., slides.]

1:45 P.M. *The Relation Between the Weight of the Endocrine Glands and Measures of Sexual, Emotional, and Exploratory Behavior in the Male Albino Rat.* SARAH FERRALL ANDERSON, Radcliffe College.

The work reported in this paper was done jointly with E. E. Anderson in the Psychological Laboratory of Harvard University.

A negative relation between emotional (timidity) and sexual behavior in the rat has been reported in the literature. Since the glands of internal



secretion are intimately related with sexual behavior and perhaps with emotional behavior, such glands may be involved in this negative behavioral relation. The present study determines directly the relation of the weight of the endocrine glands to sexual and emotional behavior in the rat. Four tests of emotional behavior (open field defecation, water-wading defecation, emergence from stove pipe, emergence from living cage), two of sexual behavior and an exploratory test were given to 91 male rats. These behavioral data were then correlated with body weight and with the following gland weights: pituitary, anterior pituitary, thyroid, adrenals, seminal vesicles, and testes. In general, body weight, pituitary weight, and the weight of the seminal vesicles yield small positive correlations (.20 to .31) with the sexual tests and small negative correlations (— .05 to — .35) with the emotional measures. When body weight is partialled out the correlations drop markedly but still retain the same general trend as to the sign of the correlations. The thyroid weight tends to correlate positively with the emotional tests and negatively with sexual behavior when body weight is partialled out. The adrenal weights give no consistent indication of relation while the testes tend to correlate positively with the sex tests. In general, the correlations of the gland weights with the behavioral measures are so low that only the consistency of the differentiating signs of the correlations can be considered as offering any indication of relationship. [15 min., slides.]

2:05 P.M. *The Effect of Sexual Receptivity upon Emotional Behavior (Timidity) in the Female Rat.* E. E. ANDERSON, Harvard University.

Significant negative correlations have been found between measures of sexual drive and timidity in the male rat. If sexual activity is related to timidity in the female rat it might then be expected that sexually receptive females should be less timid than females not in heat. To test this hypothesis, 72 females were given an emotional defecation test in an open field when they were sexually receptive as determined by indicator males. A control group of 79 females was tested when not in heat. The mean score of the females tested when in oestrus was 4.14 fecal boluses, while the mean of the non-receptive females was 5.77 fecal boluses. The difference between the two groups is 3.2 times its standard error. A retest was given 48 hours later when both groups were non-receptive. At this second test the two groups were very close together, the mean for the experimental group being 5.19 boluses, for the control group, 4.91 boluses. Thus the decreased timidity induced by the sexually receptive state does not carry over to a test given later in the same apparatus when the females are non-receptive. Three additional tests were used with smaller groups of animals. These tests were (1) a water-wading defecation test, (2) a Stone stovepipe test, and (3) an emergence from living cage test. The latter two tests were intended to control for a possible effect of oestrus upon the mechanism of defecation independently of emotion. These confirmatory tests are in agreement—in indicating a reduced emotionality or timidity during the period of sexual receptivity in the female rat. [15 min.]

2:25 P.M. *Factors Determining the Generation of Behavior Potential in the Rat.* RICHARD S. CRUTCHFIELD, University of California.

In order to analyze the significance of five basic factors in the generation of *behavior potential*, i.e. quantitative anticipatory set or expectancy, an experimental investigation of certain aspects of the string-pulling behavior in rats was made.

These five experimentally varied factors were: (1) length of string required to pull to obtain food in training trials, (2) force required to pull string in training trials, (3) number of training trials, (4) elapsed time between crucial trial and last previous feeding, (5) force required to pull string on crucial trial.

In the 243 different conditions given by all possible combinations of the five factors, each systematically varied through a range of three values, there were tested a total of 243 rats, in accordance with R. A. Fisher's principles of efficient experimental design. Contrasted with the traditional method of single-factor variation, this design provides for *concomitant* variation of all five factors.

A quantitative measure of the specific behavior potential induced under the various conditions was made directly in terms of the total length of string pulled by the animal during a crucial trial in which, as contrasted with the training trials, there was no food-pan attached to the string.

The data treated by the method of analysis of variance indicate a significant relationship between all five factors and the amount of induced behavior potential. Greater distance to food, greater force required in pulling, and greater hunger motivation all markedly *increase* the amount of potential. A greater number of training trials, and greater force required in pulling on the crucial trial both significantly *decrease* the induced potential. Further results and theoretical interpretations are discussed. [15 min.]

2:45 P.M. *Constitutional Differences Between Contrasted Physical Types Among Dogs.* W. T. JAMES, Cornell Medical College.

For the past few years experiments on behavior among dogs of different breeds have been carried on at the Cornell Anatomy Station, Lake Mohegan, N. Y., to determine the relationship between bodily form and behavioral type. A number of conditioned reflex procedures are being used in these studies. This report describes the variation in behavior of some of the dogs in a conditioned avoiding situation. The conditioned performance consists of a movement of the foreleg to avoid an electric shock. A signal precedes the shock for five seconds and then coincides with it for five seconds or more. The painful irritation is avoided if the foot is raised. No definite criterion of conditioning is used. The dogs are rated on an excitatory-inhibitory ratio, and other characteristics of the response including the nature of the leg movement, latent period, generalization, and behavior during the interval between signals.

The behavior differences vary from the extremely inactive and passive type to a highly active and excitable type, with intermediates which form a graded series. The characteristic dog of the passive type is the basset

hound while that of the highly excitable type is the German shepherd and saluki. These dogs are also contrasted in bodily form. By studying the behavior of these widely differing physical types, and then the hybrids obtained by crossing them, we determine the relationship between bodily form and behavior. [15 min., slides.]

3:05 P.M. *Coöperative Solution by Chimpanzees of a Problem Requiring Serial Responses to Color Cues.* MEREDITH P. CRAWFORD, Yale Laboratories of Primate Biology.

This problem required pairs of chimpanzees to coöperate in making serial responses to four colored stimuli, two of which were available to each animal. Four identical stimulus presentation boxes were placed around the outside of an experiment cage. In the movable stimulus holder on the face of each box could be placed any of the four colored stimuli. The stimulus holders could be interlocked in any order, so that the yellow, green, red, and blue stimuli had to be operated in sequence, regardless of location. When the terminal stimulus, blue, was pushed, food was released from a vender. The six chimpanzee subjects included two children and four adolescents. As preliminary training individual subjects learned by trial and error to operate the four stimuli in correct sequence. For coöperative work the cage was divided by a grille, so that two stimulus boxes and a food vender were available to each subject on either side. Each animal learned to watch the partner, and to respond to its choice of stimuli by making proper sequential choices. During delays three subjects (two adolescents and one child) solicited their partners to continue work. The solicitation of the adolescents differed markedly in its development from that of the child. The dominant adolescent solicited by command, while the subordinate one seemed to beg. Solicitation gestures showed elements of *directiveness* in that a chimpanzee pushed or led her partner toward a *particular one* of two available devices. Coöperation forced by the dominant animal, when the subordinate one received no food reward, was frequently observed. [15 min., slides.]

3:25 P.M. *An Experimental Investigation of "Taboo" Formation in a Group of Monkeys.* IRVIN L. CHILD, Yale University.

In order to determine whether and how a "taboo" might be established in an infrahuman primate group, the following situation was applied to a group of three rhesus monkeys. Each animal was free to mount a platform to obtain a piece of banana. This act resulted in the cage floor being momentarily lowered a half inch into hot water, so that the other animals, when present in the cage, were punished. Another platform was available with carrot reward, and with no punishment involved. Inhibition of the tendency to take banana appeared rapidly and persisted in each animal, the principal source apparently being undirected commotion of the other animals. The inhibition generalized somewhat to behavior of an animal when in the cage alone, but not to the taking of carrot. [10 min.]

3:40 P.M. *A Study of the Variable and Stereotyped Behavior of the Monkey in a Problem Situation.* WILTON P. CHASE, Woman's College, University of North Carolina.

Three monkeys were observed once a day for a total of 152 days each in their attempts to open the door of a small wire cage (problem box) to obtain food. Their reactions to the situation were variable for several days, but as soon as a method was hit upon which satisfactorily solved the problem, it became stereotyped. When the problem situation was changed slightly variable behavior was again manifested, but stereotyping took place rapidly. Their behavior when presented with slight variations in the problem demonstrated that insight was relative. There was never any loss in their insight as to how the cage opened, but they showed no ability to acquire an insight for a refined method of manipulating the fastenings. It would seem that insight is necessary to avoid stereotyped behavior patterns. [10 min.]

3:55 P.M. *Retention of Conditioned Responses Following the Conditioning of Conflicting or Mutually Inhibitory Movements.* W. N. KELLOGG, Indiana University.

The object of the present study was to determine the nature of the response that would be retained or reproduced after several varieties of conditioning in which interfering or conflicting reactions were called out by the same stimulus. The buzz-shock technique was employed and young mongrel dogs were used as subjects. The same animals at different stages of the training were conditioned (a) to lift the *right* forepaw to the buzz, (b) to lift the *left* forepaw to the buzz, and (c) to lift *both* forepaws simultaneously to the buzz (bilateral conditioning). In bilateral conditioning it was necessary for a dog to support its weight with its neck, by pressing downward against the restraining collar of the stock. The conditioned buzz-stimulus remained the same throughout all phases of the experiment. Retention tests in which the buzz alone was used were made after intervals up to three months. Since the buzz had previously been associated with several kinds of responses, some of which were mutually inhibitory, it was necessary during the retention tests for the animals to make a selection between the different previously-conditioned reactions. In all instances the Law of Recency was found to operate. The type of responding movement which had last been made in the conditioning situation was reproduced after an interval, even though other less difficult movements had occurred much more frequently at earlier periods in the training. The interpolated time interval had little observable effect, therefore, upon the nature of the response. The behavior after an interval was substantially a continuation of that which had occurred when the training was stopped. [15 min., slides.]

## ROUND TABLES

FRIDAY, SEPTEMBER 9, 4:00 P.M.

1. *Experimentation in Hypnosis.* MILTON H. ERICKSON, *Chairman.* 100 Derby Hall. (Discussion participants: L. F. Beck and Robert Sears.)
2. *Testing Personality of Children.* P. S. DEQ. CABOT, *Chairman.* 109 Derby Hall. (Discussion participants: M. A. Durea, J. B. Maller, F. N. Maxfield, C. R. Rogers, E. A. Rundquist, and P. M. Symonds.)
3. *Experimental Methods in E.S.P. Research.* JOHN L. KENNEDY, *Chairman.* Room 100, Chemistry Building. (Discussion participants: L. D. Goodfellow, T. N. Greville, H. O. Gulliksen, G. Murphy, and J. B. Rhine.)

## ADDRESS OF THE PRESIDENT

SOME RAPPROCHEMENTS IN CONTEMPORARY  
PSYCHOLOGY

JOHN FREDERICK DASHIELL

UNIVERSITY OF NORTH CAROLINA

FRIDAY, SEPTEMBER 9, 8:00 P.M.

CHAPEL, UNIVERSITY HALL

The members of the Department of Psychology will entertain the members of the Association and their guests at an informal smoker in the Faculty Club after the Presidential Address.



## PERSONALITY

Saturday, September 10, 9:00 A.M.

Social Administration Auditorium

G. M. STRATTON, Chairman

9:00 A.M. *The Effect of an Understanding of the Changing Probability Character of Knowledge on Personal and Social Attitudes.* RALPH H. OJEMANN, State University of Iowa.

Pragmatic knowledge possesses a "changing probability" characteristic. Knowledge cannot form the basis for action unless dependence of probable success upon error in data is realized.

Present society overlooks this characteristic. Conflicts between youth and adults and immature attitudes toward controversial problems furnish illustrations.

Tests of three hundred high school seniors and adults show that fundamental nature of knowledge is not understood. Some relation of the concept to attitude is indicated by differences in prejudices between groups possessing and lacking a functional understanding of the concept. Evidence that the relationship may be causal is indicated by reduction of prejudices following training in understanding.

In addition to pointing out a problem of widespread significance the data throw light on the relation of knowledge to attitude. Changes in fundamental concepts may assist in reorientation of personality. [10 min., slides.]

9:15 A.M. *A Factor Analysis of Some Tests Purporting to Measure Persistence.* G. R. THORNTON and J. P. GUILFORD, University of Nebraska.

A battery of representative tests of persistence was administered to 189 university students. The battery included ten performance tests administered individually in one two-hour session, and a rating scale and questionnaire administered in class. Ten other related measures were included to aid in the interpretation of the results.

Simple intercorrelations were found between all twenty-two measures, and these correlations were factor-analyzed in order to obtain evidence upon three problems: (1) Is there high positive intercorrelation between tests purporting to measure persistence? (2) Is there a generalized trait of persistence that influences the scores on all the tests? (3) What common factors account for the scores on these supposed tests of persistence?

The results did not reveal significant intercorrelations between all of the tests. Nor did the factor analysis reveal any factor universally present in the tests. The analysis, however, did reveal the presence of five common factors. Two of these factors are tentatively described as (1) an ability and/or willingness to withstand discomfort in order to achieve a goal, and (2) a factor of keeping on at a task (plodding). These two factors bear some resemblance to certain aspects of persistence, but

neither seems properly labeled "persistence." Three additional common factors in the tests are: (3) physical strength, (4) mental fluency, (5) feeling of adequacy. These names, particularly the last, must be considered somewhat tentative.

Observation and direct logical analysis of the table of simple intercorrelations yield supporting evidence of the reality of the above five common factors. The results indicate the desirability of further investigation of the factors of keeping on and withstanding discomfort, both of which are possibly of practical importance. [15 min., slides.]

9:35 P.M. *Social Adaptability in High School Pupils.* JAMES P. PORTER, Ohio University.

Suggestions for social situations were supplied by college students. Many of these were given to high school pupils and also to recognized experts in this field. Forty-two were selected for trial with five experimental schools. The tests were of the multiple answer form, each test being marked by the subject for the best and worst thing to do. The teachers rated each pupil for adaptability by the paired comparison method. The test has a test-retest reliability of .70 plus minus .04; the ratings, of .95 plus minus .006. There is a low positive relationship between the test and ratings, and an even lower relationship between test scores and intelligence. Correlations with the Link Personality Test will be reported. Mr. Charles S. Gibbons is largely responsible for the findings given above. [10 min., slides.]

9:50 A.M. *Factors in Personal History of College Students as Related to Personality Adjustment.* FRED MCKINNEY, University of Missouri.

The Thurstone Personality Schedule was administered to 359 undergraduate college students. After an interval of about a month three check list questionnaires were given to the same group. The questionnaires included items in their familial, school, play, health, and subjective histories. The students were divided into three groups on the basis of personality adjustment scores. The percentage of individuals checking each of the 196 items was calculated for each of the three groups. Critical ratios were determined and used as a basis for ranking the importance of the item in development.

Fifty-two of these items differentiated students with high Thurstone scores from those with low Thurstone scores, producing a critical ratio of 2.7 or above. Thirty other items had critical ratios between 2.0 and 2.7. A sample of the most differentiating items of *familial relationship* is, in order of significance, "frank sex enlightenment," "opportunities for responsibilities," "understanding child," "companionship," "anticipation of child's needs," "dominance of family by child," "criticism before others," "frequent quarrels," "anxiety over child's morals." Most differentiating historical items during *grade school period* are "almost perfect physical body," "strong interest in only one member of opposite sex," "fear of several teachers," "several embarrassing classroom experiences," "few friends," "sensitiveness to physical appearance," "physical

development later than average," "considerable day dreaming," "limited playmates." Most differentiating historical items during *high school period* are "almost perfect physical body," "spontaneity in group," "considerable day dreaming," "critical of self," "sensitiveness to own physical appearance," "exceptionally good health," "few friends," "mild physical defects," "sensitiveness because of insufficient money," "jealousy for brother or sister," "health below average," "limited playmates," "speech defect or other nervous habit," "several embarrassing classroom experiences," "fear of fights." [15 min.]

10:10 A.M. *The Relationship Between Personality and Physique*. P. S. DEQ. CABOT, Simmons College and Cambridge-Somerville Youth Study.

This report deals with an examination of the Kretschmerian correlation between types of body build and characteristic personality patterns, with particular reference to *normal* personality. Two hundred and twelve normal and adolescent boys were used as subjects. Personality data were collected by means of a special interview technique, self-rating scales, teacher estimates, and standardized tests. The constitutional types were carefully selected by several judges, and three well-known constitutional indices were used. Various methods of comparing the constitutional types and personality characteristics were employed. As a result of this study it was clear that (1) there was little evidence to support Kretschmer; (2) considerable difficulty was experienced in using constitutional indices to differentiate pyknomorphs, athletomorphs, and leptomorphs; (3) there is reason to believe that Kretschmer has unduly emphasized nativistic factors; (4) a new theory of socio-biological advantage is postulated whereby "socio-sthenic" traits are associated with biologically "good" physique. This theory emphasizes environmental influences to a far greater degree than Kretschmer's theory allows. [15 min.]

10:30 A.M. *Personality as Revealed by Voice and Conversation Without Face to Face Acquaintance*. E. LOWELL KELLY, Connecticut State College.

Amateur radio operators rarely meet personally the other amateurs with whom they communicate. Nevertheless, after a number of repeated "contacts" operators form judgments concerning each other's personality. Advantage was taken of this natural experimental situation to compare personality ratings based on voice and conversation alone, with ratings made by personal acquaintances.

Fifty amateur 'phone operators were each sent 11 personality rating scales covering 36 traits with instructions to: (1) send 5 scales to other amateurs "known" but never met personally; (2) give 5 scales to personal acquaintances; and (3) rate himself. Sufficient ratings were returned to base the analysis on 27 amateurs. Correlations between average personal and average amateur ratings ranged from  $-.24$  to  $+.61$  with a median of  $+.22$  for the 36 traits. Self ratings agreed more closely with judgments of personal acquaintances than with those of amateur acquaintances. [10 min.]

10:45 A.M. *Twinning as a Factor Influencing Personality.* LILLIAN PORTENIER, University of Wyoming.

This study is an attempt to determine how twinning as a social (not biological) factor influences personality. More specifically the question which has been raised is, How do twins compare in personality traits as measured by tests with ordinary siblings?

In securing data to answer this question twelve pairs of twins were matched with twelve pairs of siblings who were of the same sex and approximately the same age and social status. The following battery of tests was used in securing data on certain aspects of personality: The O.S.U. and Otis Intelligence Tests, Bernreuter Personality Inventory, Maller Character Sketches, Allport A-S Reaction Study, Strong Vocational Interest Blank, Meier-Seashore Art Judgment Tests and North Carolina Rating Scale. The scores for measures of similar traits by different scales were consistent for these groups.

Means, standard deviations, and correlations were determined for the data for both groups to facilitate and quantify comparisons. While some of the findings are not statistically reliable the following tentative conclusions seem justifiable: (1) Traits on which the twin pairs seem to differ more than do the sib pairs are: neurotic tendencies, introversion-extroversion, dominance-submission, confidence in self, sociability, personal adjustment, and readiness to confide; (2) Greater similarity for the twin pairs than for the sib pairs was found for the measures of physical traits (height and weight) intelligence, and masculinity-femininity. (3) The twins seem to be more submissive, have less self-confidence, and are somewhat less well adjusted than are the sibs. [15 min., slides.]

11:05 A.M. *Factors in the Personality Development of Negro Children.* ELI S. MARKS, Fisk University.

Negro children in urban and rural schools of Davidson County, Tennessee, were given the Kuhlmann-Anderson Intelligence Test and five tests which are being developed for a study of Negro children. These tests were: (1) a personality inventory; (2) measures of the child's preferences in skin color; (3) a test in which the subject indicates whether a given job can be done better by Negroes or by white people, and then checks each job which a Negro would have a chance of getting if he wanted it; (4) a set of questions about the child's wishes, fears, and worries; (5) a test of attitudes toward white people and Negroes.

The relation of the responses to intelligence, the socio-economic level of the family, the child's own skin color, and other background factors will be discussed. [10 min.]

11:20 A.M. *Some Home Environmental Factors Related to Personality Adjustment in Rural Adolescents.* LELAND H. STOTT, University of Nebraska.

Scales measuring personal adjustment (Maller's Case Inventory), attitude toward home life and resourcefulness in the group situation, and a questionnaire designed to obtain information regarding certain factors of home environment were administered to 325 farm boys and 370 farm girls, ages 11 to 22.

Ratings on various aspects of the home environment were derived from the questionnaire material. Correlations between these ratings and the personality test scores were computed. The coefficients ranged up to .46. The most important aspect of the farm home environment in its relation to personality development as measured was that involving person-to-person relationships and family group activities. Other ratings, roughly in the order of their importance, were those involving the health, physical and emotional, of the parents, the economic level and the cultural level of the family. Some significant sex differences also appeared. [10 min.]

#### HUMAN LEARNING, II

Saturday, September 10, 9:00 A.M.

Chapel, University Hall

K. DUNLAP, Chairman

9:00 A.M. *Conditioned Responses in the Human Fetus in Utero.* DAVID K. SPELT, University of North Carolina.

Using a vibrotactile conditioned stimulus applied to the maternal abdomen for five seconds and as the unconditioned stimulus, a loud noise from a heavy clapper which struck against a large box, conditioned responses have been established in the human fetus *in utero* during the last two gestation months. Approximately 100 paired stimulations were required but individual differences were marked. Experimental extinction and spontaneous recovery also appeared.

Primiparae and multiparae carrying fetuses between six-and-a-half and eight-and-a-half calendar months of age were selected from patients attending a prenatal obstetrical clinic and hospitalized for the duration of the experimental period. Anterior-posterior and lateral X-ray photographs showed the position of the fetus in each case. These were supplemented by external manual examination before each experimental session and, if necessary, by the fetal heart sounds. Three pairs of receiving tambours over the fetal head, arms, and legs recorded movements and a newly developed pneumograph registered maternal breathing. Unaware of the purpose of the work, patients were "examined" twice daily in a quiet (not sound-proof) room.

Results will be discussed in connection with current knowledge of fetal development.

Acknowledgment is made to R. A. Ross, M.D., Chief of the Obstetri-



cal Service, Watts Hospital, Durham, N. C., where the experiments were conducted, and to Miss Madge Jarvis, graduate nurse, who assisted throughout the work. [15 min.]

9:20 A.M. *The Genetic Development of Rational Learning in Children.*  
LOUISE W. GATES, Wellesley College.

The aim of this investigation was to analyze the methods of rational learning used spontaneously by children of from five to ten years of age, in a serial multiple-choice situation which involved a motor response but no motor coordination. The child's task was to learn the correct positions for each of six toy men, hidden in sequence in the left, middle, or right compartment of a box. His only clue to learning was the "That's right" or "That's wrong" of the experimenter after each response. If a particular generalization was made, learning would be greatly simplified. No mention of such a general principle was made in the instructions, however, and the fact that the children did not make it immediately accounted for the problem-nature of the situation. Ten trials were given, five on one day and five on the following day. Verbatim records of spontaneous remarks made during learning, considered jointly with the actual learning data, were the basis for twelve categories of behavior, which were analyzed with respect to their significance for development. Analysis of the individual categories revealed increasing maturity of response *within* the general modes of behavior.

In general, development was in the direction of increasing deliberateness of exploration, and increasing ability to derive information from individual responses, and to retain this information and use it later when the appropriate item was again presented. The "emotional value" of success and failure seemed to give way to these rational forms of behavior as essential factors in learning. Results showed that all subjects were reacting to the situation as a whole, rather than to a series of discrete items. Development was then shown in the greater restriction of the problem-set which was involved in the rational forms of behavior. [15 min., slides.]

9:40 A.M. *Measures of Tendency-to-Continue: Behavior Following the Interruption of Activities.* DOROTHY RETHLINGSHAFFER, University of North Carolina.

Six hundred thirty-eight records of child behavior following interruption in eleven different activities were classified into seventeen categories of behavior. These categories were then converted into a normal scale of tendency-to-continue. By means of scores obtained from this scale the effect of varying conditions of interruption and of different barriers raised against continuing were studied.

According to the scores from the scale 29 feeble-minded subjects were not any greater in their goal fixation than 29 normal subjects of the same mental ages (6 years to 9 years, 11 months), a finding which is contradictory to Lewin's interpretation of the personality of the feeble-minded child. The normal subjects were found more frequently at the positive

end of the scale while the feeble-minded were distributed toward the lower end. Though only two differences of means of the eleven measures of tendency-to-continue had critical ratios of over three, the feeble-minded were consistently lower in all mean scores except one. Reliability coefficients were .85 for the combined groups, .87 for the feeble-minded, and .89 for the normal subjects. [15 min., slides.]

10:00 A.M. *Measurement of Dynamic Balance with a Walking Beam Test.* HAROLD G. SEASHORE, Springfield College.

The problems were: (a) to develop a simple, objective, and reliable test of dynamic balance (defined as the degree of successful performance of a task in which the subject's center of gravity is continuously being shifted because of the nature of the task), and (b) to describe the development of the ability to maintain dynamic balance between the ages 5 and about 20 years. Male subjects were used.

The test consists of a series of walking beams of constant height and length but varying in width from one-quarter inch to four inches. In heel-to-toe fashion and with hands on hips, the subject walks as far as he can on the series of four or five progressively narrower beams appropriate for his age. The test proves to be simple, interesting and objective as to scoring. High coefficients of reliability are obtained when a special scoring principle is employed. The coefficients derived from correlating the average of three odd trials with the average of three even trials and applying the S-B formula are between .83 and .90, for all ages except age 15, for which the value is .75.

The genetic study shows increases from age to age but also much overlapping of the distributions for the ages. The best 25 per cent of the boys of 7 and 8 years do as well as the poorest 25 per cent of the youths 16 to 18 years. The curve of the median scores rises steadily from age 5 to 18, but definite negative acceleration is seen after year 10. Dain, Hanson, and Whitney coöperated as graduate assistants. [15 min., slides.]

10:20 A.M. *A Study of the Development of Intelligence in Prematurely Born Children.* ARTHUR L. BENTON, New York Hospital and Cornell University Medical College.

As part of a general study of the development of prematurely born children, the intellectual development of these children is being investigated by means of standard preschool tests. Psychometric investigation of a sample of 78 children of preschool age yielded the following results: (1) As a group, prematurely born children do not significantly deviate from the average in respect to intelligence level. (2) No relationship between intelligence level and birth weight is found. (3) By the time the third year of life is reached, the slight intellectual retardation associated with premature birth has, in the great majority of cases, been overcome. [10 min., slides.]

- 10:35 A.M. *Decreases in I.Q. of Children Under an Unfavorable Environment.* BETH L. WELLMAN and HAROLD M. SKEELS, University of Iowa.

Marked decreases in I.Q. of young children under an unfavorable environment were obtained. The unfavorable environment was residence in an orphanage in which numbers of children lived in a "cottage" under the supervision of untrained help, with a minimum of play facilities and no planned educational program. The trend of change in I.Q. with increasing length of residence was toward feeble-mindedness or borderline classification. Seventy-six cases were studied over a residence period of approximately four months, 96 cases over nine months, and 65 cases over 20 months.

Another group of children initially equal to the above, who experienced the same regime except that they attended preschool for several hours a day, showed a distinctly different pattern of growth. The trend in this group was toward normality. Ninety-one cases were studied over a residence period of four months, 90 cases over nine months, and 40 cases over 20 months.

Analysis of the changes in the two groups has been made according to length of residence for each ten-point initial I.Q. classification.

The findings bear upon the concept of feeble-mindedness to the extent that they show that individuals of average intelligence may be made feeble-minded through environmental influences.

The material reported above constitutes one unit of a three year coöperative study by Skeels, Updegraff, Wellman and Williams on various aspects of development of the above groups. [15 min., slides.]

- 11:15 A.M. *Some Evidence Against the Common Notion of Chance (Random) Behavior in Human Maze Learning.* GLENN D. HIGGINSON, University of Illinois.

*Problem:* To check validity of common assumption that "chance factors" operate as major determinants of maze learning behavior.

*Method:* One maze pattern was learned four times during one sitting. The variable concerned the spatial relations between pattern and learner. Four learning positions, determined by clock-wise rotations of maze were as follows: (1) starting place directly ahead of learner; (2) at 90° to his left; (3) and (4) at 180° and 270° respectively. Two mazes—Warden U and Foster—were used. Thirty males learned each.

*Results: Warden U.* (1) Relative frequency of entrances remains strikingly constant among all blind alleys; (2) without a single exception, alleys on the four learnings rise and fall together in terms of entrance and avoidance; (3) as evidence of very rigid determination, as contrasted with "chance" determination, graphs based upon entrance frequency for each of the 44 alleys (4 mazes x 11 alleys) touch but twice. *Foster maze.* (1) Results were essentially identical with those of Warden maze in uniformity of alley avoidance and entrance; (2) graphs of alley entrances for all 4 learnings rise and fall together; (3) as evidence of uniformity,

we find that graphs based on entrances of each alley on mazes I, II and III do not touch.

*Conclusions:* (1) Although repeatedly learned and eliminated, alleys most difficult (least difficult) in the beginning remain most difficult (least difficult) at the end; (2) data reveal very rigid determination of a non-chance order; (3) data point significantly for theories of transfer—alleys entered large number of times on first learning do not later become easy ones; (4) learning is an orderly process whose determinants emerge immediately and operate constantly and uniformly; (5) the task itself imposes a very specific structure upon the learner. [15 min.]

11:35 A.M. *Voluntary and Involuntary Finger Conditioning.* DELOS D. WICKENS, Ohio State University.

In a comparison of voluntary and involuntary conditioning, one group of subjects was required to lift the finger when a light appeared, another lifted the finger to an electric shock. A buzzer was the conditioned stimulus. After 150 reinforcements, the buzzer alone was sounded. Then a series of ten reinforcements was given, preceded by instructions never to respond unless shock or light occurred.

Results indicate that, in general, subjects of both groups could not inhibit the conditioned response. The curve of acquisition of the CR to shock was smoother, and steeper in its initial stages, than that of acquisition of CR to light. Latent time of the CR to shock was shorter than that of the CR to light. These results bear upon the validity of the suggestion that conditioning of muscles under voluntary control is not true conditioning. [10 min., slides.]

## PHYSIOLOGICAL PSYCHOLOGY, II

Saturday, September 10, 9:00 A.M.

100 Chemistry Building

E. C. TOLMAN, Chairman

9:00 A.M. *An Hypothesis Concerning the Mechanism of Appetite.* PAUL THOMAS YOUNG, University of Illinois.

The facts of food preference, of food choice consistent with tissue needs of variation in food demand with such factors as change in diet, partial approach to satiation, habituation, etc., call for an interpretation in terms other than the contractions of an empty stomach.

To account for these facts it is assumed that a general bodily need for protein, salt, fat, carbohydrate, water, and other kinds of substance is present in the gustatory and olfactory cells as well as in other cells of the body. The blood stream, being a medium of chemical exchange, circulates substances to all bodily cells including the sensory cells of taste and smell. It is assumed, following J. L. Mursell, that the taste and smell cells respond to various substances by positive and negative chemotropisms. The thresholds of excitability of these cells vary for specific substances with their own internal chemical state.

The hypothesis of chemical regulation explains the relation between tissue need and food demand. But it remains to be shown how these chemotropisms initiate general positive and negative responses, and how the individual learns to like and to dislike particular foods. [15 min.]

9:35 A.M. *Stimulation of Cutaneous Sensations of Heat.* FLORIEN HEISER, Connecticut State College.

It has been generally assumed that cutaneous sensations of heat are aroused and dependent upon simultaneous stimulation of the so-called warm and cold spots. The present experiment indicates that heat sensations are relatively easy to elicit from cutaneous areas lacking in cold spots and at least 2 mm. distant from any cold spot, but are fairly rare in areas lacking in warm spots when stimulated mechanically with a 2 gm., 2 sec. stimulus. 28.1% of 648 spots, anesthetic to cold at 22° C., yielded heat sensations at 47° C., while only 7.9% of 2,393 spots which were insensitive to warmth of 39° C. produced heat sensations. These results indicate that heat sensations are independent of the stimulation of cold spots. [10 min.]

9:50 A.M. *Does the Alrutz Theory of 'Heat' Apply to the Common Experience 'Hot'?* WILLIAM LEROY JENKINS, Lehigh University.

According to Alrutz, the experience of 'heat' is physiologically dependent upon simultaneous stimulation of warmth and paradoxical cold. Usually cited as *proof* of this theory are the 'heat grill' experiments of Cutolo, Burnett and Dallenbach, etc., in which simultaneous stimulation with mild warmth and cold resulted in consistent reports of 'heat' from trained observers. In a recent study, totally naïve individuals failed to report 'hot' consistently in response to similar grill stimulation. However, neither the positive synthetic effects with trained observers nor the negative results with untrained subjects have much direct bearing on the problem. They provide, at best, only presumptive evidence concerning the constitution of the natural experience from high temperature stimulation.

A critical test of the Alrutz theory can be made much more directly. If the experience is really *dependent* upon the presence of paradoxical cold, 'hot' should never be reported from areas where cold sensitivity is either absent or not functioning. With a large group of naïve subjects, this was checked in three ways: (1) By high temperature stimulation of cold-adapted and normal skin. (2) By high temperature stimulation of cold-sensitive and non-cold-sensitive areas. (3) By seriatim stimulation of a number of marked spots, alternately with high and low temperatures, which also provides a check on the consistency of reporting.

All three techniques gave similar results. Reports of 'hot' occurred with approximately equal frequency whether cold sensitivity was present or absent. Cold is not necessary for the common experience 'hot,' and the Alrutz theory does not apply. Whether it holds even for the experience called 'heat' by trained observers must be determined by a similar direct attack. [15 min., slides.]



10:10 A.M. *Action Potentials Elicited by Gustatory Stimulation.* CARL PFAFFMANN, Cambridge University.

Action potentials from nerves supplying the cat's tongue following the application of solutions of sodium chloride, hydrochloric acid, quinine hydrochloride, and sucrose to the lingual surface were recorded by means of a capacity-resistance amplifier, loudspeaker, and Matthews oscillograph.

Nerve strands which showed responses characteristic of single units were obtained by dissecting the original nerve trunks. The potentials elicited by such chemical stimuli were found to be typically of smaller magnitude than those called out by touch or pressure. The receptors can be classed as slow adapting in type and appeared to respond specifically to certain of the four testing stimuli. A quantitative analysis of the response is made. [10 min., slides.]

10:45 A.M. *The Effect of Small Doses of Adrenalin on Certain of the Higher Mental Functions.* ROLAND C. MOORE and D. EWEN CAMERON, Worcester State Hospital.

The problem here investigated was the effect of dosages of adrenalin upon the higher integrative mental functions. Three groups of ten subjects were used, and were given a specially arranged test battery, including an ink-blot series, an association test, an arithmetic problem, a free association task, and indeterminate pictures. Tests were administered so that half of each test would be given before, and half after a rest period, during which one-half c.c. of adrenalin was given to two groups. For one group the order of the test items was reversed.

Statistical analysis shows great individual variation, with greatest group differentiation appearing in the "organization" response of the ink-blot series, and in reaction times. Qualitative analysis for trends is also made, and psycho-somatic correlations given. Implications for adrenal activity in the recovering insulin-treated schizophrenic are discussed. [10 min.]

11:00 A.M. *The Dark-Adaptation Curve of Normal Rats and Rats Deprived of Vitamin A.* CLIFFORD T. MORGAN, University of Rochester.

Biochemical data reported by other investigators have indicated that vitamin A plays an important rôle in photochemical processes of rod vision. The present paper reports behavioral data concerning the relation of vitamin A to absolute brightness sensitivity.

A new discrimination technique and an apparatus, in which reward, punishment, stimulus control, and recording are automatic, were devised. The animals were required to press a lever beneath a lighted panel to procure food and a lever beneath a dark panel, when pressed, delivered shock.

After an hour of light-adaptation, animals were tested for one-half hour after varying periods of dark-adaptation. The test period and the brightness level were so arranged that during the test period the number of correct responses increased to a significant level. The data from five

or more such test periods at one brightness were plotted together in five minute steps to determine the time in the dark required to permit 75% correct responses. Tests were given at one-half log unit brightness steps from 1 to  $10^{-6}$  millilamberts. Brightness was controlled by means of neutral filters. Individual dark-adaptation curves were obtained for eight vitamin A-depleted and four normal rats.

(1) The vitamin A-deprived rat's dark-adaptation rate is slower than the normal rat's. (2) The normal rat's lower limit of sensitivity is about  $10^{-6}$  millilamberts. (3) With prolonged A-depletion, rats fail to attain this limit. (4) A discussion of the kinetics visual purple regeneration from vitamin A is presented.

Acknowledgment is made to Dr. Samuel Clausen and Miss Augusta McCoord of the University of Rochester, School of Medicine, for assistance in the preparation of animals and diets and in biochemical controls. [15 min., slides.]

11:20 A.M. *The Size of the Cat's Pupil as a Function of Stimulus Brightness.* WILLIAM E. KAPPAUF, University of Rochester.

Ten animals were tested in the present experiment to determine the relationship between stimulus brightness and pupil size for the normal adult cat.

The subjects were restrained in a canvas jacket and placed within a large, vertical stimulus cylinder in such a position that flash photographs could be taken of their head and eyes. An electric light bulb located above and behind the animal's head illuminated the white walls of the cylinder, providing a stimulus of relatively uniform brightness embracing the entire visual field. A graded series of light bulbs and a small projection unit made it possible to secure any desired stimulus intensity. The photographs were taken with a telephoto lens on single frames of 16 mm. film. By means of a Compur shutter and a projection system arranged outside the cylinder, flash exposures of  $1/50$  of a second were obtained.

The jacket-type holder which was employed restrained the animals in a normal crouch position and permitted them freedom of head movement. Under these conditions, struggling during the experiment was practically absent.

The results indicate that the cat's pupil varies in width from some 12 to 14 mm. under conditions of complete darkness to 2 mm. or less when the brightness of the visual field exceeds 300 millilamberts. The pupil is almost circular and of relatively constant size throughout the range of brightnesses between the animal's absolute threshold and .01 millilambert. The most important changes in width are observed with increase in stimulus intensity from .01 to 100 millilamberts.

These data will be discussed in their relation to comparable measures made of the human pupil and as they aid in an evaluation of the capacity of the cat for visual discrimination at different levels of brightness. [15 min., slides.]

PROGRAM OF THE AMERICAN ASSOCIATION OF  
APPLIED PSYCHOLOGISTS

SEPTEMBER 5, 6, 7, 8, 1938

COLUMBUS, OHIO

## MONDAY, SEPTEMBER 5

9:00-10:00. Registration. Headquarters, Administration Building.

10:00-12:00. Meetings of professional committees.

*Group A.* Committees on Standards of Training. W. V. BINGHAM, *Coördinating Chairman*. Faculty Club, South Lounge.

1. Committee on Applied Instruction in Colleges and Secondary Schools. EDWIN R. HENRY, *Chairman*.
2. Committee on Dissertations in Applied Psychology. A. T. POFFENBERGER, *Chairman*.
3. Committee on Graduate Instruction in Applied Psychology. FRANK N. FREEMAN, *Chairman*.

*Group B.* Committees on Internal Activities of the Profession. DOUGLAS FRYER, *Acting Coördinating Chairman*. Faculty Club, Grand Lounge.

1. Committee on Applied Journals. JAMES P. PORTER, *Chairman*.
2. Committee on Professional Employment. ROBERT HOPPOCK, *Chairman*.
3. Committee on Professional Ethics. WARREN W. COXE, *Chairman*.
4. Committee on Working Conditions of Applied Psychology. E. LOWELL KELLY, *Chairman*.

*Group C.* Committees on Applied Techniques. ROBERT T. ROCK, *Coördinating Chairman*. Derby Hall, Room 202.

1. Committee on Standardized Tests. HENRY E. GARRETT, *Chairman*.
2. Committee on Technical Manuals. HERBERT A. TOOPS, *Chairman*.
3. Committee on Standardized Test-Norms. JACK W. DUNLAP, *Chairman*.

*Group D.* Committees on Public and Professional Relations. JOHN G. JENKINS, *Coördinating Chairman*. Derby Hall, Room 100.

1. Committee on Relations with Educational Profession. M. R. TRABUE, *Chairman*.
2. Committee on Relations with Engineering Profession. HENRY C. LINK, *Chairman*.
3. Committee on Relations with Medical Profession. FRANCIS N. MAXFIELD, *Acting Chairman*.
4. Committee on Relations with Social Workers' Profession. EDWINA A. COWAN, *Chairman*.
5. Committee on Public Exhibits. RICHARD H. PAYNTER, *Chairman*.
6. Committee on Relations with Government. EDMUND G. WILLIAMSON, *Chairman*.

10:00-12:00. Meetings of Special Committees. H. B. ENGLISH, *Coördinating Chairman*. Social Administration Building, Auditorium.

1. Committee on Charter of Incorporation. ROBERT G. BERNREUTER, *Chairman*.
2. Committee on Constitution. J. E. ANDERSON, *Chairman*.
3. Committee on Quantitative Standards of Membership. L. J. O'ROURKE, *Chairman*.
4. Committee on Relations with Community Health Survey (U. S. Health Service). J. B. MINER, *Chairman*.
5. Committee on Membership Certificate. GERTRUDE HILDRETH, *Chairman*.

10:00-12:00. Meetings of Committees Appointed by the Sections and the Board of Affiliates. University Hall, Rooms 200, 201, 205, 209.

12:00-1:30. Board of Affiliates Luncheon. JAMES Q. HOLSOPPLE, *Chairman*. (Representatives of all state and regional associations invited.) Faculty Club, Wicker Dining Room.

12:00-1:30. Charter Membership Survey Committee Luncheon. MORRIS S. VITELES, *Chairman*. (Territorial representatives requested to be present.) Faculty Club, Main Dining Room.

12:00-1:30. Editorial Board of the Journal of Consulting Psychology Luncheon. Faculty Club, Private Dining Room.

[Note: Club facilities available to all members of the Association for meals.]

1:30-3:00. Conference of Professional Committees. DOUGLAS FRYER, *Chairman*. (Discussion open to participation by entire membership.) Social Administration Building, Auditorium.

- 2:00-4:00. Conducted Tour of the Bureau of Juvenile Research, State Hospital for the Insane and Institution for the Feeble-minded. FRANK P. BAKES, *Conductor*. (Assemble promptly at the Bureau, 2280 West Broad Street, at 2:00.)
- 3:00-5:30. Symposium: Consulting Psychology in Professional Schools. RICHARD H. PAYNTER, *Chairman*. Derby Hall, Room 100.

*What Can the Psychologist Contribute to the Professional Schools?*

ALICE I. BRYAN—*Status of the Testing Program in Accredited Library Schools*. [20 minutes.]

HAROLD G. SEASHORE—*The Consulting Psychologist in a School of Music*. [20 minutes.]

W. V. BINGHAM—*The Psychologist in the Engineering College*. [20 minutes.]

Discussion.

- 3:00-5:30. Round Table (Panel Discussion)—The Work and Training of Psychologists in State Hospitals. ANDREW W. BROWN, *Chairman*. Derby Hall, Room 201. Panel: Edgar A. Doll; Elaine F. Kinder; Carney Landis; Emmett L. Schott; David Shakow; Lee E. Travis; Mary P. Wittman.

- 5:30. Final Business Meeting of the Association of Consulting Psychologists. ROBERT A. BROTEMARKLE, *Chairman*. Derby Hall, Room 100.

- 6:00. Dinner. Faculty Club (informal gathering).

- 7:15-7:55. Public Meeting. DOUGLAS FRYER, *Chairman*. University Hall Chapel.

Announcement: JOHN P. SHEA—*Psychology in the Service of Forest and Human Conservation: An Announcement of the U. S. Forest Service*. [5 minutes.]

Address: HENRY C. LINK—*Forty Nation-Wide Studies in Public Opinion and Buying Habits: A Report of the Psychological Corporation*. [Slides.]

Intermission—5 minutes.

- 8:00-9:15. General Session. (Public invited.) University Hall Chapel.

1. Vice-presidential addresses:

1. *Clinical*—ANDREW W. BROWN—*The Challenge to Clinical Psychologists*. [15 minutes.]

2. *Consulting*—RICHARD H. PAYNTER—*Some Aspects of Consulting Psychology*. [15 minutes.]

3. *Educational*—PERCIVAL M. SYMONDS. *A New Meaning for Educational Psychology*. [15 minutes.]

4. *Industrial*—HAROLD E. BURTT—*The Status of Industrial Psychology*. [15 minutes.]

Intermission—5 minutes.



- 9:15. Organization Meeting of the A.A.A.P. (adjourned from 1937). University Hall Chapel.

For action on Charter Membership and Constitution.

Final reports of officers of the Association of Consulting Psychologists and Clinical Section, A.P.A.

TUESDAY, SEPTEMBER 6

- 9:00-10:30. Business Meeting of the Educational Section. PERCIVAL M. SYMONDS, *Chairman*. Social Administration Building Auditorium.
- 9:00-10:30. Symposium: The Work of Psychologists in Institutions and Child Guidance Clinics. ANDREW W. BROWN, *Chairman*. Derby Hall, Room 100.
- Reports of Survey Committees Appointed by the Clinical Section:*
- JAMES Q. HOLSOPPLE—*Psychological Work in Prisons*. [15 minutes.]
- AUGUSTA T. JAMESON—*Psychological Work in Schools for Delinquent Boys and Girls*. [15 minutes.]
- ELAINE F. KINDER—*Psychological Work in Institutions for the Feeble-minded*. [15 minutes.]
- C. M. LOUTTIT—*Psychological Work in Child Guidance Clinics*. [15 minutes.]
- Discussion.
- 9:00-10:30. Business Meeting of the Industrial Section. HAROLD E. BURTT, *Chairman*. Derby Hall, Room 103.
- 10:30-12:00. Business Meeting of the Consulting Section. RICHARD H. PAYNTER, *Chairman*. Derby Hall, Room 102.
- 10:30-12:00. Symposium: The Training and Duties of the School Psychologist. P. M. SYMONDS, *Chairman*. *What Is the Future Development of the Vocation of School Psychologist?* Social Administration Building, Auditorium.
- MARGARET BARKER—*Duties of the School Psychologist*. [20 minutes.]
- ROBERT C. CHALLMAN—*The Training and Duties of the School Psychologist*. [20 minutes.]
- BERTHA M. LUCKEY—*The Psychologist in a Large School System*. [20 minutes.]
- ARNOLD H. HILDEN—*The School Psychologist and the Child Guidance Clinic*. [20 minutes.]
- Additional participants: C. M. Louttit, Grace Munson, M. L. Reymert, Wilda Rosebrook, Milton Saffir.
- T. ERNEST NEWLAND—*School Psychologists in a State Program*. [20 minutes.]

- 12:00-1:30. Luncheon for the Representatives of the Psychological Corporation. Faculty Club, Main Dining Room.
- 1:30-3:00. Business Meeting of the Clinical Section. ANDREW W. BROWN, *Chairman*. Derby Hall, Room 105.
- 1:30-3:00. Symposium: Judging Personality Traits in Employment Practice. ARTHUR W. KORNHAUSER, *Chairman*. *What Is the Success to Date of Improved Interview Techniques and Measurement Methods?* Social Administration Building, Auditorium.
- RICHARD S. SCHULTZ—*A Balanced Combination of Methods*. [15 minutes.]
- MARION A. BILLS—*Judgments Based on Interest Analysis and Personal History Data*. [15 minutes.]
- A. P. HORST—*Quantitative Study of Personality Qualifications*. [15 minutes.]
- R. N. McMURRY—*Guidance for the Interview*. [15 minutes.]
- Discussion.
- 3:00-4:30. Symposium: Psychology and Mental Hygiene. JAMES B. MINER, *Chairman*. *What Are the Recent Advances of Mental Hygiene?* Chemistry Building, Auditorium.
- L. M. ROGERS—*The Mental Health Program in the United States Health Service*. [20 minutes.]
- H. MELTZER—*Mental Hygiene and Family Adjustment*. [15 minutes.]
- HARRIET E. O'SHEA—*Mental Health Problems in College*. [15 minutes.]
- SAUL ROSENZWEIG—*Psychological Concepts and Therapy in Mental Hygiene*. [15 minutes.]
- Discussion: Led by John J. B. Morgan; Fred McKinney.
- 3:00-4:30. Symposium: Techniques for Remedial Instruction. PAUL A. WITTY, *Chairman*. *An Appraisal and Evaluation of Current Practices*. Derby Hall, Room 100.
- E. A. BETTS—*Bases of Effective Reading Instruction*. [20 minutes.]
- DAVID KOPEL—*Identifying the Poor Reader*. [20 minutes.]
- MARION MONROE—*Remedial Techniques in Group Instruction*. [20 minutes.]
- LOU LA BRANT—*Wholesome Reading is Remedial Reading*. [20 minutes.]
- Discussion: Led by Gertrude Hildreth; Paul Witty.
- 4:30-6:00. Board of Affiliates Business Meeting. JAMES Q. HOL-SOPPLE, *Chairman*. Derby Hall, Room 102.

- 4:30-6:00. Symposium: Psychological Testing of Auto Drivers. ALVHH R. LAUER, *Chairman*. *What Can Psychology Contribute to Safety of the Highways?* Social Administration Building, Auditorium.
- EARL ALLGAIER—*Age and Driving Efficiency?* [15 minutes.]
- ALAN CANTY—*The Case Study Method of Rehabilitating Drivers*. [15 minutes.]
- HARRY DESILVA—*The Use of Apparatus in Testing Drivers*. [15 minutes.]
- AGNES A. SHARP—*Characteristics of Accident Repeaters*. [15 minutes.]
- MORRIS S. VITELES—*Selection of Commercial Drivers*. [15 minutes.]
- THEODORE W. FORBES—*Individual Differences in Drivers*. [15 minutes.]
- Discussion.
- 8:15-10:00. Regular Business Meeting, A.A.A.P. University Hall Chapel.

## WEDNESDAY, SEPTEMBER 7

- 2:00-4:00. Demonstration of the work, methods, and results of the Bureau of Juvenile Research. C. H. CALHOUN, *Chairman*. At the Bureau, 2280 West Broad Street.
- 6:00. A.A.A.P. Presidential dinner and address (informal dress). G. F. ARPS, *Chairman*. Faculty Club. Reservations may be made by mail in advance. Tickets must be procured at the Registration Desk, Administration Building, *before noon, Tuesday, September 6.* G. F. ARPS—Address of Welcome.
- 7:15. Presidential address: DOUGLAS FRYER—*Applied and Professional Attitudes*.

See Program of Abstracts for Sessions on Clinical, Industrial, Educational, and Vocational Psychology arranged in collaboration with the Program Committee of the American Psychological Association.



